Initiatives to foster Chinese TVET and TVET Teacher Training

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

On behalf of
Federal Ministry
for Economic Cooperation
and Development

UNESCO
United Nations
Educational, Scientific and
Cultural Organization

UNEVOC NETWORK
UNEVOC Centre "TVET
for Sustainable Development"
Magdeburg, Germany

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Introduction

Currently, the Chinese vocational education system experiences several extensive reforms. Technical and vocational education and training (TVET) is increasingly seen as the key for solving future problems. Thus, the systems needs to provide answers to questions like the possibilities of the future work life and new working structures and also questions like the implementation of a sustainable development. But already today the vocational education system is faced with serious challenges. Highly skilled workers are needed in several working fields and also the complex working systems and the newly developed market systems demand for new solutions and concepts for their vocational training. Last but not least the globalization is an important topic in the field of the Chinese vocational education.

Thus, TVET in China needs to fit the needs of the market, the goals of the Chinese state and the international standards.
These challenges require new approaches and initiatives to foster Chinese TVET and to focus on TVET teacher training as one particularly important area.
Frank Bünning, Claudia Kalisch and Friedhelm Eicker give a first introduction for a possible practice example to integrate international standards into the initial and further education of TVET Teachers in China.
Kai Gleißner and Axel Müller show in their chapter that it is important to consider Sustainable Development as an aspect of future development and also as an aspect of the training of Chinese TVET teachers. Annika Fünfhaus emphasizes the role of sustainable development as well and points out the importance of approaching a holistic leadership training for the promotion of TVET for Sustainable Development.
Through different research results and practical experiences of the last 30 years we already know that it is not the easiest way to transfer vocational concepts from one country to other countries e.g. from Germany to China. This is also the research topic of Sun Yang who addresses the aspects we need to consider if we try to transfer different aspects into the Chinese TVET Teacher Training.
Zhangfeng Qiao and Nie Lei and their articles give a first idea of possible new developments in the teacher training in China. Zhangfeng Qiao presents a new concept of teacher training for secondary vocational schools and Nie Lei offers a new approach for the didactics in the TVET teacher education for secondary vocational schools in China.
With a broad-based focus on the Chinese TVET, Mi Jing, An Rong, Ma Jun, Wang Mei and Zhang Yu offer additional views on new developments in China.
Mi Jing and An Rong offer different theoretical approaches. In his chapter, Mi Jing focuses on the theoretical orientation of the group running model of vocational education in China. An Rong points out the new aspects of a vocational ability-oriented pedagogy in Chinese vocational education.
Ma Jun and Wang Mei on the other hand illustrate the development and reforms in the Chinese Vocational Education. Ma Jun focuses on the Chinese secondary vocational

education and Wang Mei on the Chinese higher vocational education.
Important as they are, these reforms also bring new challenges with them, as Zhang Yu explains in his article. Finally, So Yu provides an overview of the new modes and new problems of school-enterprise cooperation in China's vocational education system.

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Preface

With the advent of rapid globalization, emergence of information and communication technology and international and regional competitions, significant challenges educational systems face significant challenges. In China we experience very fast economic development. The character of work is changing continuously. Contents of job descriptions tendency focused more and more on teamwork, job-related solving problem and environ-mental protection. Considering these tendencies the requirements for TVET in China, are broadly based specialist knowledge, correlative thinking, the assumption of process responsibility, autonomy in doing the work, willingness to work flexibly in groups and readiness to undergo continuing training. This, of course, has impacts on teachers, schools and last the TVET system. Reform processes in the Chinese TVET System aim to change the role of teachers, improve leadership competences of headmasters and focuses on quality on all levels of the TVET system. Teacher training and education as well as in –service training of Chinese educational personal is a main topic of new TVET strategies and reform processes of the Government.

Teachers are important factor in education reforms. Modern vocational education and training has shifted from preparing students for narrowly defined jobs to broader preparation for life in a volatile labor market. This changes the role of teachers from being instructors passing on professional traditions to becoming facilitators and even counselors helping students to develop key competences so they can adjust more flexibly to changing demands.

In general, we need a change from passive students, to management by individual learning arrangements.

The needs of teachers must therefore be considered from a holistic perspective - at the planning stages of reform, in policy and strategy development, at University level in research and teacher training and in the school environment, which is also dealing with rapidly changing conditions. Traditional function of schools as "trainers of youth" is moving into new areas.

In this publication the contributions focused those different aspects.

The academic community is aware of the important implications of the development of TVET in fast developing countries. As China has enjoyed special attention in German development cooperation, models in TVET teachers training and in-service training are debate in this book.

We hope that this book will be of service to researchers, leaders and teachers in the study of TVET in Germany and China, as well as for the broader context of internationalisation in TVET and programme delivery.

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Part A:

New Developments in the Training of Chinese TVET Teachers

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Implications of the UNESCO International Framework Curriculum for Initial and Further Education of TVET Teachers in China

The ongoing globalisation and resulting changes in the education of skilled workers require a unique framework in TVET teacher training as well as a system of further education for teachers. Such a framework can be the basis of a TVET teacher training which can lead to joint programmes and co-operations throughout the world. This enables countries to learn from each other. Best practice examples can be adopted and adapted according to the requirements of the respective country. The quality of VET in general will be enhanced and the mobility of TVET teachers strengthened. This article describes the objectives of the framework curriculum suggested by the UNESCO for degrees in TVET teacher training worldwide. Additionally, the description of a model Master degree course and the framework curriculum are presented, followed by organisational requirements. The Master Degree for TVET teacher training implemented at Otto-von-Guericke University Magdeburg is described as an example of how the framework can be realised successfully. Furthermore, an initiative from Rostock University highlights the implications of the Framework Curriculum for further education of TVET teachers.

Objectives of the Framework Curriculum

An ongoing debate in TVET teacher training centres on its quality worldwide. The professional development of TVET teacher training is a focal point in guaranteeing the competitiveness of a country on the world market. Therefore, "education, training and human resources development has become of outstanding importance for a sustainable and competitive development […]" (UNEVOC, 2005, p. 13). In accordance with this, the UNESCO defined an international framework curriculum concerning a Master degree in TVET which aims to define "a set of quality criteria for the education of teaching and lecturing professionals in initial and further education and training" (UNESCO, 2004, p. 1). These quality criteria can be found in the model Master degree course described in the framework. It offers a basis on which all higher education institutions can work when establishing Master courses in TVET teacher training. Furthermore, the framework is the basis for future international scientific co-operations.

Another important objective defined in the international curriculum is the provision of a basis for the mutual exchange of students, lecturers and scientists to work together internationally on developments in TVET. Additionally, the mutual recognition of student's credits is enhanced since the model Master course provides possible modules and the respective credit points (see UNESCO, 2004. p. 1). This may lead to the harmonisation of Master degree courses in TVET teacher training throughout the world.

Framework Curriculum

The framework curriculum defines the modules as well as their contents. Furthermore, it sets the criteria for passing a module. The framework curriculum provides for five areas of study. These comprise studies in education, TVET and vocational disciplines, studies of the vocational discipline and its didactics, further studies, the Master's thesis and practical studies and internships respectively.

The first area, studies in education, TVET and vocational disciplines, encompasses 39 credit points in total. This study area is further divided into foundational studies and advanced studies. Foundational studies include module 1 which deals with foundations, theories and structures of education as well as TVET and Human Resources Development (HRD) and module 2 which takes a look at shaping TVET in connection with the vocational discipline. The advanced studies consist of module 3 and 4. Module 3 includes teaching and learning in exemplary fields of practice and module 4 deals with the management and evaluation of TVET and workforce development.

The second area, studies of the vocational discipline and its didactics, encompasses 18 credit points in total. It is also divided into foundational and advanced studies with module 5, vocational discipline I, as foundational stage and module 6, vocational didactics in the discipline I as advanced stage.

The third area, further studies, comprises modules 7 and 8 and has a volume of 36 credit points in total. Both modules offer the possibility of specialisation in the vocational discipline (module 7) and in vocational pedagogy (module 8).

The Master's thesis is to be written about an individual topic, which is to be proposed by the student and for which 15 credit points are granted. For the period of practical studies and internships respectively the student gains 15 credits as well. The aim of the practical studies is the planning and organisation of learning, teaching and training (UNESCO, 2004, p. 4-6).

Description of the Master degree course

The target group of an internationally applied Master degree course is graduate students in vocational education. This means that teachers, trainers and lecturers are given the opportunity to gain an internationally recognised Master degree which enhances their knowledge in a special vocational discipline and pedagogy. The degree issued to graduates is to be a Master in Technical and Vocational Education and Training (TVET)

with a length of study of 90-120 credits according to national regulations with one credit point comprising of 25-30 hours workload. In order to study this Master course students have to have a degree equivalent to competencies gained on Bachelor level. The framework curriculum encompasses twelve vocational disciplines which can be applied as topics during the course. Thereby, one topic can be incorporated into another vocational discipline according to regional and national requirements. An example for a vocational discipline is the area of „Production and Manufacturing“ which offers manufacturing, mechanical engineering design, supply/environmental engineering and automotive engineering as possible areas of study (see UNESCO, 2004, p. 2).

Organisational requirements

In order to be able to implement the UNESCO framework curriculum certain organisational requirements have to be met. A rather central statement in the framework curriculum is that the Master degree course has to be implemented by a higher education institution or a consortium of such institutions. Furthermore, a certain amount of research capacity and capabilities have to be in place. The same holds for the qualification of the teaching personnel. Additionally, several occupational disciplines/domains should be offered at an organisational entity. A further requirement is that international research co-operation has to be incorporated into the course (UNESCO, 2004, p. 6).

Implementation of a Master degree course in TVET teacher training according to the proposals of the international framework curriculum

The implementation of a Master of Science in Technical and Vocational Education and Training based on the UNESCO framework curriculum has started in cooperation of the GIZ (formerly InWEnt), Magdeburg University and universities in China and Vietnam in 2004. Advantages that could be identified during this period of time are the international comparability, recognition and relevance.

Otto-von-Guericke-University of Magdeburg in Germany has developed a M.Sc. course which operates over four semesters in co-operation with Southeast University (China), Tianjin University (China), and University of Technology Education (Vietnam). The course is titled “Technical and Vocational Education and Training” and leads to a dual/joint degree. The development of national TVET systems in China and Vietnam is confronted by several problems. Amongst others, initial and further (in-service) vocational education and training of specialised personnel is still considered difficult and problematic.

The main reason is that these countries lack appropriately developed structures for their vocational education and training systems because of historic factors, many the result of years of economic neglect. The lack of professionally trained personnel in

public and private training institutions is also a significant factor.

These two points were key drivers for the development of a course for the initial and in-service training of specialised personnel involved in TVET. The Department of Vocational Education and Human Resource Development at Otto-von-Guericke-University of Magdeburg in co-operation with the Asian partner universities deliver the international course of studies that leads to a professionally qualifying degree "Master of Science in Technical and Vocational Education and Training" which is in line with the needs of China and Vietnam.

Access to the course can only be granted following successful completion of professionally qualifying studies (degree at bachelor level). The course lasts for four semesters and a total of 120 credit points (one credit point is equivalent to a workload of 30 hours) are awarded. The curriculum is structured according to modular principles and tuition is bilingual (Chinese/Vietnamese and German), that contributes to the students' internationally oriented training. In addition to teaching being carried out by experts from all partner countries, students will have the opportunity of spending a part of their studies in different countries (at e.g. partner institutions of the Otto-von-Guericke-University); thus, the international dimension can be integrated into the curriculum. These new innovations have a considerable effect on the courses' attractiveness and support the further development of the international profile, consequently contributing to a higher quality of study.

The table below summarises the modules included and indicates the share of responsibilities for the program.

Table: Survey of Modules

No.	Modules	ECTS-Credits[1]		
		Partner[2]	OvG[3]	Total
1.	**Common Studies**	9		9
Foundational Studies		**23**	**17**	**40**
2.	**Foundations, Theories and Structures of TVET**			10
	Research methodology in TVET	4		
	Theories of Vocational Education I	3		
	Vocational Education Psychology	3		
3.	**International Vocational Education**			4
	Comparative Vocational Education	4		
4.	**Shaping TVET I**			9
	Curriculum Development in TVET I	2		
	Measurement and Evaluation in Vocational Education	3		
	Instructional Technology I	4		

5.	**Shaping TVET II**			9
	Theories of Vocational Education II		9	
6.	**Shaping TVET III**			8
	Curriculum Development in TVET II		4	
	Instructional Technology II		4	
Advanced Studies		**12**	**9**	**21**
7.	**Vocational didactics**		9	9
8.	**TVET-Management and Evaluation**			12
	Vocational Educational Management	5		
	Project Management	3		
	Management Psychology	4		
Vocational Discipline and its didactics			**18**	**18**
9.	**Vocational Discipline and it's didactics**			9
	Introduction in the didactics of the vocational discipline		3	
	Applied didactics of the vocational discipline		3	
	Teaching and learning laboratory work		3	
10.	**Studies of practice in TVET**		9	9
Area of Specialization		**12**		**12**
11.	**Specialization module (compulsory module)**			**12**
	Further studies in the vocational discipline			
	Human Resources Development			
	Theory and Practice in Vocational Training			
	Comparative and International Vocational Education			
	Vocational Education for Special Needs Students			
	Educational Management			
	…			
Master Thesis		20		20
Total ECTS-CP		120		120

[1] ECTS-Credit-point (CP) is the equivalent to a workload of 30 (teaching and independent (study) hours.

[2] Tianjin University (China), Southeast University (China), University of Technology Education (Vietnam)

[3] Otto-von-Guericke-University (Germany)

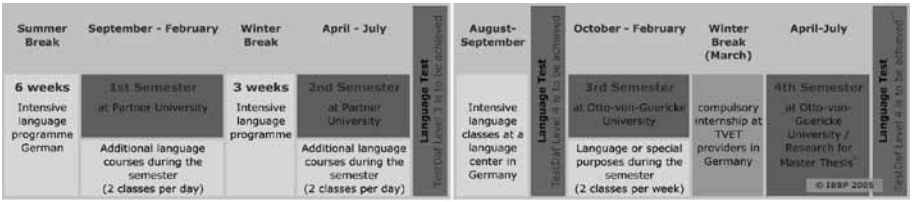
Summary:

CHN/VIETNAM		44 CP
Otto-von-Guericke-University (OvG)		44 CP
Master Thesis (CHN/VIETNAM and OvG)	20 CP	
Specialization (CHN/VIETNAM or OvG)	12 CP	
Total		120 CP

Course of Studies

Before students start their regular studies as part of the degree programme, they are required to attend extra language classes (German) in their home countries. In the first semester, studies at Southeast University (China), Tianjin University (China) or the University of Technology Education (Vietnam) are carried out. As part of their studies students attend extra German classes. The second semester is carried out comparably. Additionally, a summer school was implemented. This will involve the further preparation of the Asian students in terms of language knowledge and skills at a language centre in Germany until appropriate structures will be established at the Asian partner institutes. The summer school includes a language proficiency test. It is expected that students pass TestDaF (German as a foreign language) level 4. During the third semester, the students study at the Otto-von-Guericke-University in Magdeburg. In addition to their regular classes, students are offered languages classes for special purposes in TVET. During the semester break students intern at TVET institutions and TVET providers in Germany. During the fourth semester, the students research for a Master's thesis at Otto-von-Guericke-University. Generally, the master's theses are finished at Otto-von-Guericke-University but in exceptional cases it may be finished at the partner universities in China or Vietnam. However, the theses are jointly evaluated by one university teacher from the partner institution concerned and one university teacher from the Otto-von-Guericke-University.
The course progression is illustrated in the flow chart below:

Figure 1: Flow Chart of Joint Master Degree Programme in TVET



* The Master Thesis is to be started in Magdeburg in July and may be finished in the student's home country by October at the latest. It will be jointly evaluated by the partner universities.
** Those students who have not passed the TestDaf level 4 have to pass the examination by the end of the master programme, otherwise a degree from Magdeburg university can not be awarded. However, they can still achieve the degree from the partner university.

Further Education of TVET Teachers following the UNESCO International Framework Curriculum

Besides initial TVET teacher training, further education of teachers has been given much attention in China. On the basis of dramatic economic and social changes as well as changing production processes and qualification requirements the qualitative improvement of TVET is an essential concern. New curriculum and training concepts are in line with the changing production processes. In order to incorporate the new demands student-centred learning approaches and competence-based learning are currently implemented. In contrast to many other countries, Chinese TVET colleges are in the position to develop their own curriculum. This offers much potential to develop new curricula that meet the immediate needs of the Chinese economy.

However, in order to put teachers in the position to develop modern and competency-oriented curricula, tailor-made further education programs are urgently required. Currently, the demand for further education programs in the area of curriculum development and competency orientation cannot be met.

Description of a Co-operation Project

In this context, a co-operation between the Institute of Vocational and Adult Education (IVAE) in Beijing and the Rostock University has been initiated and a research and development project was launched in 2008. Six TVET colleges in Beijing serve as implementing partners.

One major objective of the co-operation is to qualify teachers to develop and implement new training concepts. The precondition for more production- and competency-oriented TVET is the development of an awareness of current and modern production structures. Additionally, teachers need to consider new/advanced approaches to learning and teaching in TVET.

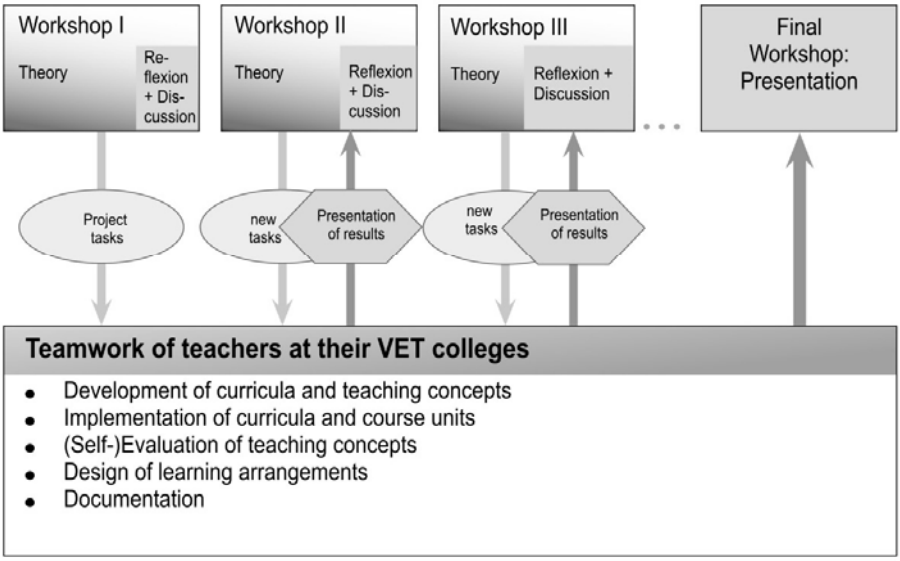
In recent years, China has intensively analysed Germany's TVET concepts. However, these concepts cannot be automatically transferred to China. They have to be adapted to China's economic and social conditions. The TVET teachers play an essential role in this process. As it has already been mentioned, Chinese colleges are legally obliged to develop their own curricula. This requires well qualified teachers.

The co-operation project reflects upon these demands. As traditional forms of further education are by no means in position to meet current qualification demands, innovative forms of TVET teacher further education are required. Modern training concepts cannot be simply transferred; they need to be experienced by teaching staff.

The further education program that has been developed reflects the outlined demands. The following flowchart illustrates the concept of the further education program.

[1] Beijing College for Electrotechnic and Technology, Beijing Information Technology College, Beijing College of Finance and Commerce, Beijing Vocational College of Labour and Social Security, Beijing Business School

Figure 2: Flowchart of the further education program



The further education program is based on workshops that alternate with teamwork phases. The workshops are conducted on weekends as the program is in-service. The content of the program is firstly based on recommendations of the UNESCO Framework Curriculum and secondly elaborated with IVAE and the teachers of the participating TVET colleges. Consequently, the number and the content of the workshops meet the most pressing needs.

Each workshop consists of a theory and an application/discussion part. The theoretical part is delivered by the German partners. The contributions cover e.g.

- Work process-oriented curricula
- Development and implementation of learner-centred learning and teaching concepts
- Assessment/Evaluation of student's achievements using portfolios
- (Self-)Evaluation of teaching concepts
- (Self-)Evaluation of organisational structure
- Design of learning arrangements
- …

In the application/discussion parts of the workshops chances and opportunities to put these concepts into practice in Chinese colleges are discussed. Whereas the first workshops set the knowledge base for modern curriculum and training concepts the later workshops set a stronger focus on the discussion of developed concepts by the participating teachers.

During the time between the workshops, the teachers work in groups at their colleges in order to develop and to apply these concepts. In this teamwork phases teachers are

asked to translate the elaborated theory into curricula and teaching concepts. Additionally, teachers participate in classes of other teachers and discuss the applied learning and teaching approaches. The intensive interaction between the teachers involved is a crucial element of this program. These discussions contribute to the competence development of the teachers. The program is an in-service measure of a period of approximately two years.

One hard-output that has already evolved is a solid database of innovative teaching concepts tailor-made for learner-centered teaching concepts in a number of vocational areas. In order to encourage other teachers (who had not been involved in the project) to apply the concepts booklets presenting best-practice examples have been published.

Further Education of TVET Teachers and the UNESCO Standard Framework Curriculum

The project of the TVET teachers further education in China described corresponds closely with the requirements of the UNESCO Standard Framework Curriculum. This framework requires an interaction between research and further training of TVET teachers. This has been incorporated in the project as Rostock University contributes its latest research findings. Furthermore, participants of the program are encouraged to conduct own research such as analyses of production processes and evaluation material. The framework curriculum further fosters the consideration of applied didactics in special fields:

- Module 3 “Teaching and learning in exemplary fields of practice”,
- Module 4 “Management und evaluation of TVET and workforce development”,
- Module 6 “Vocational Didactics in the Discipline”,
- Module 8 “Assessment and Evaluation”.

The introduced project directly reflects these modules.

For the teaching staff that has not studied in degree programs in accordance with the UNESCO Standard Framework Curriculum this project offers the opportunity for further education regarding the contents depicted in the framework.

The program is designed to run until October 2011 and is presently evaluated. It is anticipated to extend and continue this innovative form of further education at TVET colleges in Beijing.

Résumé

Diversity can be both a strength and a challenge. Varying structures and practices in TVET at a global level make co-operation challenging. Internationalisation and global developments demand co-operation more immediate than ever before. The field of Vocational Education has been an area in which co-operative international degree programmes are rare. The co-operative delivery of degree programmes has been practised in other domains such as Business Administration and fields of modern

sciences, e.g. Bio-engineering, more frequently.

The implementation of the international framework curriculum for a Master Degree in TVET provides an impetus and guidelines for joint degree structures and thus it can be seen as a milestone in international co-operation. The case study illustrated how the framework curriculum is translated into actual degree structures.

The case of this multi-national Masters Degree programme in TVET and further education initiatives exemplify how the international dimension can contribute to strengthening higher educational institutes' competitiveness in an international context as well as to help further develop Asian-European economic structures.

References:

– UNESCO (2004): International framework curriculum for a master degree course for TVET teachers and lecturers. Hangzhou, China.

– UNEVOC (International Centre for Technical and Vocational Education and Training) (2005): UNESCO International Meeting on Innovation and Excellence in TVET Teacher/Trainer Education - Documentation from the meeting. Bonn.

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Integration of Vocational Education for Sustainable Development into the Training of Chinese TVET Teachers at the Otto-von-Guericke-University

Background

In 2002 the United Nations declared the years from 2005 till 2014 as the United Nations Decade of Education for Sustainable Development. This international initiative's claim is to deliver the principles of sustainable development into the different national education systems.

Already in 1993, the BMU pointed out that Vocational education and training plays an important role in the field of sustainable development (cf. BMU, 1993, p. 261).

The globalized world of today is characterized by dynamic changes in many areas of the economy and society. The need to shape these processes sustainably is becoming ever clearer and so is the fact that the key to this challenge lies in education and training. Within this context, the UNESCO has declared strategies such as "Education for All" and "Education for Sustainable Development" with specific goals and provisions for the field of vocational education and training.

Furthermore on April, the 17th 2002 the Federal Government of Germany decided about „Perspectives For Germany", the National Sustainable Development Strategy and therefore stressed, that sustainable development is a vital target of its actions.

The National Sustainable Development Strategy designs their vision of the future of our country with the help of the following four guidelines:

- inter-generation fairness
- life quality
- social solidarity and
- international responsibility.

In November 2004 the Federal Goverment did its first review about the strategy with the progress report 2004. This report combined the results of a public consultation progress, as well as the conclusions of the committee, called „Nachhaltigkeit im Visier" (Focus on Sustainability).

This strategy also has different influences on the higher education of Germany. So universities are challenged to educate their students in a way, that they are able to solve the complex problems of the modern society and to establish sustainable development on all levels. To give science and sustainability more substance and acceptance a dialogue between universities could deal with the subject to generate more public attention (Hochschulrektoren-Konferenz, United Nations Decade, 2010).

In the field of vocational education it means that VET for sustainable development has to contribute to developing, strengthening and disseminating ways of sustainable thinking and acting (cf. Diepenbrock, 2005, p. 96). The workers should be able to use their knowledge and their qualifications to identify social, economic and ecological challenges of modern societies and to develop ideas and strategies for suitable solutions. Thus, it is important that VET does not only impart technical and specialized knowledge but also develops conceptual and systemic thinking and acting (cf. de Haahn, 2003 / Hahne, 2008, p. 62).

Vocational Education and Training for sustainable development

Vocational education and training is an important part of social life, particularly suitable for the sensitizing of young people for the topic of a holistic, sustainable development of society as a whole.

Vocational Education and Training is an important gateway in regard of the prospective life of young people, which are preparing themselves in this special stage of their life for future tasks in working life. Young people with their attitudes and values will have an important influence on future social developments on the basis of their future occupational activities. (cf. BMBF, 2010)

For this reason, vocational education and training is given the special responsibility, besides the placement of the necessary and therefore fundamental technical knowledge for a future professional life, to implement special attitudes and values which are absolutely necessary for a holistic approach to sustainable development of society.

The ultimate ambition of vocational education and training is the development of so called operational competence (cf. Bader / Müller, 2002), as defined in training rules and core curricula. Operational competence stands for the balanced development of skills and competencies in professional, social and even in individual areas of the personality of young people. The development of operational competence is aiming at a comprehensive personality development, which will allow young people to deal with future tasks of their working life, as well as social and private life in an active and responsible way.

Vocational education for sustainable development means acting in a permanent conflict zone between economical, ecological and social interests (cf. Schulz / Gessner / Kölle, 2006), which makes it absolutely necessary to extend the goal of vocational education and training within the area of development of operational competence in adding additional competencies like system competence and the competence of organisation. (cf. Hahne, 2006)

Thus, the use of competence of organisation shall empower people to use knowledge about sustainable development and to recognise problems connected with occurrences of non-sustainable development and thus find solutions towards sustainable development.

System competence is the ability and willingness to understand, to analyse and to influence the more and more complex growing technical and social systems.

The newly introduced learning field concept is regarded as especially suitable for the impartation of corresponding competencies within vocational education and training. This means to reverse in a radical and fundamental way from a traditional, strongly, systematically structured instruction, teacher focused training, with trainees in a rather passive learning role.

The learning field concept was introduced within the last decade. It means a completely new concept of an action-oriented instruction within the area of vocational education and training, which is truly oriented on real working- and business processes. (cf. Bader / Müller, 2002a) This concept is regarded to generate an appropriate development of competencies in terms of vocational education and training for sustainable development, by using action-oriented learning methods, like the project oriented-methods, leittext-oriented-methods, all aiming on the active cooperation of the trainees during the instruction process. (cf. Pahl, 2007) These learning methods put the trainee in the centre of the learning process and give him an active role rather than to provoke more enduring learning effects like before.

The instruction processes and business processes which makes instructional lessons more and more relevant for practice are the basis for the lessons which are oriented on complex working processes.

The training of future teachers and trainers in the field of vocational education and training has to meet the requirements that were named above.

The Department of Vocational Education and Human Resources Development of the Otto-von-Guericke University of Magdeburg works on the integration of vocational education for sustainable development on different stages.

1st stage: Department of International Cooperation and the focus on Sustainable Development

The first stage was the implementation of the Department of International Cooperation with the focus on Sustainable Development in 2007. Within its research and training activities, the Department of International Cooperation of the Institute of Vocational Education and Training takes into account the social and political conditions of VET, the promotion of education for sustainable development, international VET standards and the challenges of transition processes. The Department works together with international partners on tailor-made solutions.

During the last years, the department has conducted several programs with a focus on Indonesia. Amongst other projects, this included the organisation of the International Leadership Training (ILT) in cooperation with the GIZ (formerly InWEnt).

This program aimed at training vocational teachers and organizational staff in the field of human resource development, VET and sustainable development.

Since 2007, the associated Department of International Cooperation supports the IBBP decisively in the development and realisation of international study programmes and further education programmes as well as the acquisition and realisation of international projects. The framework of the work is based on the core research areas technical and vocational education for sustainable development and professionalisation of vocational education and training teachers, trainers, and other expert staff.

2nd stage: The UNEVOC Centre Technical and Vocational Education and Training for Sustainable Development

The second stage is the institutionalized cooperation with the institutions GIZ (formerly InWEnt) and Fraunhofer Institute for Factory Operation and Automation IFF. The result of this cooperation is the UNEVOC Centre Technical and Vocational Education and Training for Sustainable Development. The UNEVOC Centre Magdeburg was founded by the three Magdeburg institutions GIZ (formerly InWEnt), Otto-von-Guericke-University and the Fraunhofer Institute for Factory Operation and Automation IFF with the aim to contribute to the implementation of the aims and strategies of UNESCO and the UNESCO-UNEVOC International Centre.

Therefore Magdeburg belongs to the international network of the UNESCO for sustainable education. One aim of the network is the advancement of vocational education, especially in developing countries with a specific focus on education for sustainable development.

The UNEVOC Centre Technical and Vocational Education and Training for Sustainable Development has declared the aim to develop contents, programs, methods and media for a vocational education for sustainable development and to integrate those in the practical field with different instruments and the ability to use them sustainably.

The UNEVOC Centre Magdeburg puts its main focus on “Education for Sustainable Development” and concentrates on the following topics:

- Development of concepts for education and further training of VET teachers,
- Development of curricula and learning and teaching materials for VET,
- Human resources development,
- VET and sustainable development,
- Development of innovative learning environments for professional education and further training.
- Integration of aspects considering sustainability in the design and system competence in the curricula (according to United Nations Decade of Education for Sustainable Development 2005-2014)
- Implementation of a practical, working-process oriented vocational education
- Generation of “lighthouse” institutions as role models in the field of

vocational education
- Further education of education personnel
- Development of a holistic, level-surrounding concepts
- Improvement of the international cooperation and the scientific knowledge transfer (according to the Federal Ministry of Education and Research program for international exchange)
- Creation of the basis for stronger scientific and educational networks (according to the Federal Ministry of Education and Research internationalisation of universities)

To reach these goals the UNEVOC Centre Technical and Vocational Education and Training for Sustainable Development has started a lot of international cooperation projects. Interdisciplinary collaboration, which guarantees the knowledge transfer between theory and practice plays an important role in this.

The Department of Vocational Education and Human Resources Development of the Otto-von-Guericke University of Magdeburg offers different research activities in the context of the UNEVOC-Centre for vocational education for sustainable development.

Main focuses of the research in the field of sustainable development are:

- Vocational education under the aspect of internationalisation, globalisation and sustainable development
- Didactic-methodical concepts for the realisation of sustainable development in vocational training, courses and work place
- Design of future-oriented curricula
- Integration of sustainable development concepts into degree courses at the Otto-von-Guericke-University Magdeburg
- Socio-technical systems research and networks
- Concepts and processes of educational policy
- Vocational pedagogy in international comparison- state surveys considering different topics of the vocational education research
- Evaluations
- Design of educational concepts for a sustainable development
- Design and development of media (blended learning, computer-based learning)
- Education as a process handling social and political problems
- Education as an answer to the demographic change
- Vocational education and ecological challenges.

The department assures a high quality education by the constant implementation of recent scientific research into the degree courses and further education programs.

3rd stage: Vocational Education and Training for Sustainable Development as reference point in the training of future teachers and trainers at the IBBP

A last stage is the implementation of vocational education for sustainable development into the education of vocational teachers.

The Department of Vocational Education and Human Resources Development offers four study courses (B.Sc. für Berufsbildung, M.Ed. Lehramt berufsbildende Schulen, M.Sc. Berufsbildung und betriebliches Management, M.Sc. International Vocational Education) in which future teachers and trainers in the field of VET are trained. Especially the M.Sc. International Vocational Education focuses on the training of International TVET teachers and trainers. So this program runs in Cooperation with several Chinese Universities e.g. Tianjin University or South-East University Nanjing.

Besides the impartation of important technical, pedagogical and didactical knowledge an important focal point is especially given to the point of the training in technical didactics of future teachers and trainers focusing to the aspect of VET for sustainable development.

Especially in the technical field of vocational education and training there are a lot of topics which can easily be connected and implemented to the subject of VET for sustainable development.

So, environmental problems and environmental protection plans can be focused under the aspect of VET for sustainable development, especially with regard to the important topic of energy generation and distribution against the background of an increasing climate change. This is a highly important and current topic, which has to be included in the training of future teachers and trainers as well.

Against the background of a constantly growing energy demand andat the same time decreasing energy sources like oil, coal and gas, connected with an accelerating climate change, the social acceptance of new technologies in the field of renewable energies like photovoltaic, solar heating, geothermics or the use of water and wind energy is growing as well as their economical importance.

Especially the field of technical didactical training of future teachers and trainers of VET in the vocational field of electrical engineering, civil engineering and the metals technology is predestined to engage in the topic of renewable energies, for instance like photovoltaic or solar heating in regard of a VET for sustainable development, to highlight their importance in the dimensions of ecology, economy and society. With the help of the principles of sustainable development like efficiency, consistency and sufficiency their importance for future work and life can be strengthened.

Technical didactical training therefore is aiming at the development of suitable learning and teaching settings and especially aiming at the identification of useful topics and methods to implement VET for sustainable development in the curricula of VET.

Examples of implementing the topic of sustainable development on an operational base can be: the calculation of the ecological footprint, the calculation of CO2-balances, the use of project-methods, the conduction of explorations, as well as the use of customer order.

The IBBP tries to meet these requests by implementing those topics and methods within the technical didactical training of future teachers and trainers in the area of VET, especially within the fields of electrical engineering, civil engineering and metals technology.

It is particularly important to sensitise future teachers and trainers as early as possible in the field of VET, which means during their university training, because their future activities as educational personnel will enable them to work as multipliers for the goal of a sustainable development.

The IBBP offers regular seminars which are dealing with the topic of sustainable development on a broad base. The chance to acquire a broad knowledge base to the topic of sustainable development is given to all interested students of all disciplines; they are informed about the current state of research and become familliar with strategies of implementing sustainable development into society.

At present, several research projects are in preparation at the IBBP within the area of VET for sustainable development.

For instance, there is currently a project in preparation for the developing of strategies, which will offer solutions in regard to the increasing complexity of working tasks to craftsmen, who have to deal more and more often with the demand of combination of several application areas in which they are originally not trained. This is especially the case in the field of renewable energies, which creates new demands, in terms of skills and abilities for craftsmen.

The IBBP is also participating in close collaboration with companies of the region in the installation of a competence centre for renewable energies in the city of Magdeburg. This competence centre for renewable energies will have its main focus on the education and future training of experts in the field of renewable energies on an regional, national and also international level.

In addition to that, the IBBP also takes part in the development of several software-projects within the field of e-learning, like the development of new concepts of education and training in the field of electronic media. An actual project is the project "effekt"- a blended learning based internet program within the initial training of future professionals in the area of electrical engineering.

Other activities are planned with the development of an internet based learning program in the field of renewable energy topics in collaboration with the German–Jordanian University of applied science in Amman.

Thus university research as well as education and training is picking up current new developments and demands of professional, vocational reality, especially within the area of renewable energy technologies and tries to implement new solutions for VET for sustainable development. Like this, the unversity makes a real contribution to the modernisation of the German higher educational system, focusing on education for sustainable development, accordingly to the demands of the Agenda 21.

Literature

- Bader, R./ Müller, M. (2002): Leitziel der Berufsbildung: Handlungskompetenz. Anregungen zur Ausdifferenzierung des Begriffs. In: Die berufsbildende Schule 54, H. 6, S. 176-182.
- Bader, R./ Müller, M. (2002a): Vom Lernfeld zur Lernsituation. Typisierung der Transformationsarbeit in den Schulen. In: Zeitschrift für Berufs- und Wirtschaftspädagogik Bd. 98., H. 1, S. 71-85.
- Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit (Hrsg.) (1993): Konferenz der Vereinten Nationen für Umwelt und Entwicklung im Juni 1992 in Rio de Janeiro – Dokumentente. Agenda 21. Bonn.
- Bundesministerium für Bildung und Forschung (BMBF) (2010): UN-Dekade „Bildung für nachhaltige Entwicklung“, http://www.bmbf.de/de/3840.php, 27.10.2010.
- de Haahn, Gerhard (2003): Erwerb von Gestaltungskompetenz als Ziel von Bildung für nachhaltige Entwicklung, In: Bundesministerium für Bildung und Forschung (BMBF) (2003): Berufsbildung für eine nachhaltige Entwicklung, Bonn, S.46-49.
- Diepenbrock, Freya (2005): Die UN-Dekade „Bildung für nachhaltige Entwicklung“ (2005-2014) als Beispiel für den Aufbau stabiler Netzwerke In: BIBB (2005): Nachhaltigkeit in Berufsbildung und Arbeit, Bonn, S.96-97.
- Hahne, Klaus (2006): Berufliche Kompetenzentwicklung für nachhaltiges Wirtschaften im Handwerk – am Beispiel Energieeffizienz/nachhaltiger Umgang mit Energie In: Tiemeyer, Ernst / Wilbers, Karl (2006): Berufliche Bildung für nachhaltiges Wirtschaften. Bielefeld.
- Hahne, Klaus (2008): Konturen einer Didaktik für nachhaltige Entwicklung in der Berufsbildung In: Adolph, Gottfried/ Jenewein, Klaus/ Pahl, Jörg Peter et al. (Hrsg.) (2008): Lernen&Lehren – Schwerpunktthema Berufsbildung für nachhaltige Entwicklung, Heft 90, 23.Jahrgang, Wolfenbüttel, S.60-66.
- Hochschulrektoren-Konferenz, United Nations Decade (2010): http://www.nachhaltigkeitsrat.de/de/der-rat/arbeitsprogramm/?size=wbmwmjjsc#c10502, 27.10.2010
- Pahl, Jörg-Peter (2008): Ausbildungs- und Unterrichtsverfahren. Ein Kompendium für den Lernbereich Arbeit und Technik, 2. Auflage., Bielefeld.
- Schulz, Werner F. / Gessner, Christian / Kölle, Axel (2006): Nachhaltiges Wirtschaften in Unternehmen: Ein Überblick. In: Tiemeyer, Ernst / Wilbers, Karl (2006): Berufliche Bildung für nachhaltiges Wirtschaften, Bielefeld.

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Approaching a Holistic Leadership Training for the Promotion of TVET for Sustainable Development

The United Nations' call for taking active steps in education and training to promote a sustainable development expressed in the Agenda 21 has already led to big changes in educational policies and practices. Nevertheless, difficulties and insecurity in deriving and implementing concrete and holistic measures have occurred all over the world and can still be observed. In fact, sustainable development is often narrowed down to environmental protection and economic development (cf. Majumdar, 2006). Against the background of the diffuse measures taken as a reaction to the Agenda 21 often limited to the ecological dimension of sustainable development, the need for an "effective and responsible leadership" (G8 Leader 2009) has been emphasised. Therefore, this article seeks to explore the concept of sustainable leadership in TVET and define the contextual factors, the knowledge, skills and competencies required by a person to become a leader for promoting a more holistic approach to TVET for sustainable development. In addition, the article will suggest a concept for integrating these leadership requirements into one of the further education programmes for Chinese VET staff at the University of Magdeburg.

The Role of TVET in Promoting Sustainable Development

Sustainability in TVET can be interpreted in two ways: Sustainability in terms of effective TVET measures leading to a successful knowledge transfer at the workplace. Or sustainability in terms of integrating the United Nations' normative concept of sustainable development into TVET measures (cf. Kremer, 2007, p.3). The latter promotes a TVET which assigns equal status to the aims of social justice, ecological sustainability and economic performance in any undertaken activity in the private and professional life in order to ensure a development "that meets the needs of the present without compromising the ability of future generations to meet their own needs and to choose their own lifestyle" (United Nations, 1987).

With the Agenda 21, agreed upon at the UN Conference on Environment and Development in 1992 in Rio de Janeiro, a comprehensive action plan was devised for guiding the global implementation of the sustainable development mission. Chapter 36 contains a special part describing aims concerning education, public awareness as well as TVET. As the taken measures first came off diffuse and only mildly effective, the UN reinforced the role of education and TVET in particular at the next UN conference in

Johannesburg in 2002 which triggered the declaration of the UN Decade "Education for Sustainable Development" for the period from 2005 to 2014 (cf. UNECE, 2005, p.1ff.). Therein, TVET plays a crucial role since it is to develop, train and educate an appropriate workforce potential – from craftsmen to top level manager – that is able to face environmental and developmental issues and therefore brings about changes in different areas. TVET, as an element of the lifelong learning process, has two central functions: For one thing, it provides for the professional qualification of people for being able to enter the labour market and become financially independent from others in the first place. Thus, it contributes to poverty reduction, social equity, preservation of life quality and participation in democratic processes. For another, it equips people with knowledge, skills and competencies needed for assuming responsibility, making decisions contributing to sustainable development, to organise economic and private actions and resources efficiently and, therefore, in a sustainable manner while at the same time shaping a just and socially justifiable globalisation (cf. Diettrich, Hahne & Winzier, 2009, p.54). Thus, all three sustainability pillars – economic growth, social development and environmental protection – are recognised in TVET and emphasise its role in shaping a sustainable future.

Leadership for TVET for Sustainable Development

The objective of leadership is the achievement of individual or group targets by influencing or inspiring the motivation of the followership through sharing the same values, objectives, intentions and ideals, not necessarily through formal authority mechanisms (cf. Fairholm & Fairholm, 2009, p.14). A leader helps to achieve these common goals by setting directions (a shared vision), by shaping an environment that helps maintain commitment and consent, and by enabling others to lead themselves (cf. Leithwood & Riehl, 2003, p.5ff). Within sustainable leadership, also called leadership for sustainable development, this shared vision is already predefined by the objective to contribute to a sustainable development. While one used to restrict leadership to decisive management positions a sustainable leader can be described "as anyone who consciously chooses to engage in collaborative, transformative change aimed toward the goal of a sustainable future" (Sustainability Leadership Institute, 2009). Sustainable leadership also implies an engagement that lasts, i.e. it aims at engaging oneself and others in a sustainable, not only a short-lived way.

The overarching objective of a sustainable leadership in TVET is the conscious and successful integration of the concept of sustainability into the TVET practice. This implies various changes regarding TVET policies and systems (macro level), regarding the organisation of companies, vocational schools and other training providers as well as cooperation between these institutions (meso level), and regarding the design of specific work and learning situations, didactics, methodology and media (micro level) (cf. Diettrich, Hahne & Winzier, 2009, p.57). This means, policies and guidelines, vocational school curricula, teacher and instructor trainings, assessment and examination mechanisms, and formal and informal learning arrangements need to be

adapted to the concept of sustainability (cf. UNESCO-UNEVOC, 2006, p.3ff.).

The interdependent and often contradicting aims of sustainable development make the initiation of changes and the implementation of the concept of sustainability in the TVET practice a challenging task which first requires the ability to identify necessary changes, i.e. a complex expert knowledge in the field of sustainable development. Yet beyond that, it demands the recognition and acceptance by others. Therefore, leadership for TVET for sustainable development can be assigned three core functions:

LEADERSHIP ELEMENTS		
Setting directions Inspiring others to engage for the vision of sustainable development, building awareness and acceptance for its necessity, acting like a role model.	**Influencing structures** Creating and cultivating an organisational culture supportive to TVET for sustainable development.	**Empowering others** Enabling others to integrate the objectives of sustainable development in their professional and private actions.

Facilitators of Sustainable Leadership

There are certain criteria which are supposed to be met by TVET organisations and practitioners which can be referred to as facilitators for the sustainable processing of changes coming along with TVET for sustainable development: Openness to change, raising awareness, the creation of a shared vision of sustainable development, a constructive communication culture, participation, cooperation and networking, as well as an influential position in an organisation.

Openness to change means being able to adapt easily to changing conditions and engage in a lifelong learning process. Routines people tend to create to structure and perfect processes often lead to resistance to change. TVET for sustainable development, however, can only be achieved with the commitment of all the people involved. Therefore, sustainable leaders need to establish a learning culture which holds expectations changeable and revisable all the time. This can be realised by promoting double-loop learning which is achieved by admitting mistakes and working out new solutions to avoid them through the so-called deutero learning, i.e. learning to learn, which is based on the constant communication and reflection of learning processes. This way, change becomes a routine, not an undesirable exception (cf. Bea & Göbel, 1999, p.405). In the best case scenario, organisations have an internal learning culture on sustainable development supported by an extensive knowledge management which guarantees the consideration of all facets of sustainability (cf. BMU, 2009, p.5).

Therefore, before being able to initiate learning and change processes towards sustainability, sustainable leaders need to find ways to raise awareness of and an understanding for the implications of the topic for TVET practitioners. One way to increase the perceptibility for the necessity of sustainable development is to point out

the expected consequences – for the health, economic stability and ecosystems everyone depends on. Schaltegger und Kalisch (2006) emphasise the use of case studies (e.g. concrete experiences) which reveal different scenarios of the future and limitations of current practices (cf. Schaltegger & Kalisch, 2006, p.292). In order to make sustainable development aspects measurable, governments and TVET practitioners were advised to develop indicators which describe a desired future state of sustainable behaviour (cf. BMU, 1997). Sustainable leaders need to impart their knowledge about sustainable practices and the interdependence of different problems. Sustainable leaders in companies, in particular, make use of the so-called business case of sustainability, special cases which reveal the contribution of sustainable development measures to making the company more successful and innovative. Another method to raise awareness is to seek support from strategically important colleagues and departments, such as human resource development or marketing and, furthermore, to cooperate with external stakeholders who show the importance of the topic.

Leadership is most effective if it is based on values which reflect the highest ends of every individual, thus stimulating their intrinsic motivation to engage. This is achieved by creating a shared vision which sets direction for the people's way of thinking, acting and feeling. Sustainability sets two framing questions for the development of a shared vision: What kind of future do we strive for and does it meet the requirements of sustainability?

Furthermore, sustainable leadership requires the creation of a creative and productive communication culture which allows and wishes for open discussions, thus leading to innovative, shared solutions. The creative tensions resulting from diverse and sometimes conflicting opinions are not supposed to be considered a disadvantage but an opportunity for real breakthrough thinking. Sustainable leaders do not abuse their informational power but impart their visions and knowledge in a clear and simple but still scientific way which fits the target group (Ferdig, 2007, p.8).

Sustainable leadership also requires a participative culture of mutual respect in decision making processes in which every group member feels comfortable and capable to contribute to ideas and decision making. Sustainable leadership is „a distributed necessity and a shared responsibility"(cf. Hargreaves & Fink, 2003, p.6). Promoting participation has the advantage that it leads to the creation of an "ownership" for an issue which usually results in feeling responsible and in an increased engagement. It also creates a stronger bond between the participating stakeholders which legitimates organisational behaviour. Moreover, it helps detecting goal conflicts already at an early stage. Finally, participation allows for solutions that reflect the wants and needs of all stakeholders which cannot be achieved by autocratic leadership (cf. Lokale Agenda Planet 21, 2009).

A cornerstone for enhancing knowledge about TVET for sustainable development and creating innovative opportunities of cooperation practices are strategic partnerships and networks. They are especially helpful to raise awareness for sustainable development and generally allow for using and optimising individual or organisational skills and competences to achieve a shared goal (Barth, 2007, p.2). This refers to project teams within an organisation, cooperation between the VET sector and the industry and,

generally speaking, to networking between partners with complementary competences. Cooperation is used for the identification of sustainable core and general competences, the identification of new working fields and joining forces for good practice and distribute them to other TVET-practitioners (ibid.).

Finally, although it is not necessarily a prerequisite, sustainable leadership is still most effective if it comes from groups or individuals in influential positions, i.e. from persons who have access to certain information and have an impact on individuals, a group or organisation, relevant stakeholders or even on political regulations. Reality shows that especially in conservative cultures a leading position can still be a determining factor for building trust.

Demands of a Sustainable Leader

In order to describe the competencies required by a leader for TVET for sustainable development Hahne's competence model can be applied. It combines the professional, social, methodical and personal competence as defined by the Standing Conference of the Ministers of Education and Cultural Affairs of the Länder in the Federal Republic of Germany (KMK, 2007, p.11) with the so-called systems competence and the sustainable development specific Gestaltungskompetenz to an action competence for leadership for sustainable development (Hahne, 2007, cited in Hahne/Kuhlmeier, 2008). Here, it is complemented by the so-called process competence used in a study on sustainable leadership in companies by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU, 2009, p.7).

Professional competence
To be able to think and act in a sustainable manner, to show others directions and enable them to engage in sustainable development, sustainable leaders need to be sensitised to backgrounds, interrelations and fields of action of sustainable development and, in particular, the implications and strategies for the organisation of the TVET practice. This refers especially to strategies granting a better access to TVET and a quality improvement of educational processes (UNECE, 2005, p.5).

Personal competence
Sustainable leaders need to undergo a change in behaviour and attitude to make sustainable development their personal mission and to be able to engage others by always considering how their actions affect the eco-system, the well-being and the economic stability and growth of themselves, their family, their organisation, and the world (Ferdig, 2007, p.28).

Social competence
Sustainable leaders need to develop the ability to communicate their ideas and visions clearly and listen to others, so there can be a development of plans and visions that reflect the goals and ideals of everyone involved. Moreover, they need to be able

to communicate across disciplines, personalities and cultures to lead with others in a team. Thus, sustainable leadership requires hard skills like presentation techniques, but also soft skills like diplomatic and rhetoric skills, conflict and mediation skills, meta-communicative techniques as well as intercultural competence (cf. Timmer/Creech/ Buckler, 2007, S.33).

Methodical competence
Sustainable leaders have to be able to gather, structure, use and present information. Not only do they have to put the theoretical knowledge into practice and to their particular contexts, e.g. know how to create sustainable curricula, but they also need to be able to make this information tangible and assessable for others.

Process competence
Sustainable leaders need to know how to initiate measures for TVET for sustainable development and execute them with a team. This includes knowledge about how to create sustainable processes in general and about how to influence them by shaping the context. Therefore, they need to know organisational structures of their TVET system, relevant stakeholders and be able to establish an organisational culture that is adaptive, communicative, participative and networked.

System competence and Gestaltungskompetenz
To concretise their professional and methodical knowledge, system thinking is required, i.e. to have an overview of the interrelations of different factors, e.g. how ecological, economic and social systems are linked and how actions in area A affect another area B and C. The so-called Gestaltungskompetenz, roughly translatable as shaping competence, refers to the ability to create work processes, products, services and key situations for the purpose of sustainable development. Thus, in principle, these two competencies summarise all the afore-mentioned competences to an action competence for sustainable development.

A Module Concept

Taking into account all the previously mentioned professional requirements for sustainable leaders, the following module concept has been developed for the study profile Technical and Vocational Education and Training of the master programme International Vocational Education offered at the Otto-von-Guericke University Magdeburg. It intends to give equal credit to building both fundamental knowledge regarding TVET for sustainable development and constitutional sustainable leadership skills to lead and inspire change.

Programme:	M.Sc. in International Vocational Education	6 semester periods per week/ 10 CP
Module 8:	Sustainable Leadership	
Prerequisites:	Modul 1 and 2	

Course objectives:
The students should be able

- to describe concepts and theories of sustainable development and sustainable leadership;
- to specify and substantiate the objectives of TVET for sustainable development;
- to reflect upon their role as a leader and the role of leadership for TVET for sustainable development;
- to initiate concrete actions for the realisation of change processes for TVET for sustainable development;
- to motivate and enable themselves and others to engage in leadership processes;
- to create and develop a sustainable organisation and organisational culture;
- to reflect upon and create sustainable leadership in intercultural contexts.

Contents:

- scientific and political concepts, theories and discourses of sustainable development (e.g. Brundtland Report, Agenda 21, UNECE Strategy „Education for Sustainable Development);
- leadership concepts: leadership, Führung, management, sustainable leadership;
- principles of sustainable leadership: influence, raising awareness, creating a vision, communication, cooperation, cooperation, participation, capacity to change;
- implementation strategies for TVET for sustainable development;
- change processes in sustainable development projects;
- communication and conflict management techniques;
- teambuilding and motivation methods;
- participative methods;
- intercultural aspects of sustainable development and of sustainable leadership.

This module could be concretised in four individual courses:

Foundations for TVET for Sustainable Development
This lecture will introduce the students to the concept of sustainable development with special emphasis on TVET and enable them to describe and correlate economic, ecological and social objectives of sustainable development. It will raise awareness for the role of TVET for sustainable development and equip them with the expertise and methodical knowledge for the implementation of sustainable development strategies on the TVET macro, meso and micro level (policies, curricula, examinations, teacher training, teaching and learning arrangements etc.).

Sustainable Leadership Skills
This seminar will train the students' communication, vision building, conflict, team and delegation skills by making them experience how successful communication processes are created, diverse opinions are brought together and how conflicts evolve and are handled. They learn about team building, group dynamics and motivation

methods and realise and reflect upon the advantages and disadvantages of participation and cooperation in decision making processes and raising awareness.

Planning and Execution of Change Processes in an Organisation
This course is designed as a project seminar and is intended to provide the students with applied project and process management skills. By realising an sustainable development project, e.g. implementing an sustainable development strategy in an organisation or integrating sustainable development in selected TVET curricula, they holistically experience and create leadership processes from building a team, defining and planning the project and project objectives, preparing, executing, presenting and evaluating it, up to reflecting communication and cooperation processes. Besides applying leadership for TVET for sustainable development to practice, they should be able, in particular, to analyse and communicate with stakeholders and create reasonable (fictitious) cooperation.

Intercultural Aspects of Sustainable Leadership
This seminar is supposed to facilitate the knowledge transfer of TVET for sustainable development and sustainable leadership practices by reflecting upon regional interpretations of sustainability and respective implications for TVET for sustainable development, as well as upon intercultural dimensions of sustainable leadership like power distance, long-term orientation and assertiveness which will influence the opportunities and priorities for action in the students' home countries.

Résumé

Sustainable leadership differs from the traditional leadership concept in that basically everyone engaging oneself and others for sustainable development can be called a sustainable leader. This makes everyone a leader for TVET for sustainable development who consciously chooses to assume responsibility for achieving sustainable conditions in the world of work and in the society, who knows the implications of striving for sustainable development in TVET, who can set new directions and inspires others to believe in the common goal of sustainability. Nevertheless, one has to acknowledge the fact that a given authority to decide increases the effect of one's own actions and the impact on others, whether it is the impact of a vocational teacher on his class, the impact of a human resource manager on the company's strategies, employees and colleagues or the one of the governmental representative on political frameworks.
A leader for TVET for sustainable development needs, on the one hand, the knowledge about concepts and theories as well as measures and means leading to a TVET for sustainable development. This refers to strategies for the implementation of laws and guidelines, curricula, teacher training, assessment and certification mechanisms and formal and informal lesson planning. On the other hand, a leader also has to be able to facilitate change by cultivating the required conditions which promote a sustainable engagement and innovative solutions. This includes certain methodical,

communicative and rhetorical skills in order to impart knowledge across the disciplines and make it assessable and tangible for everyone. Moreover, it means to be able to engage others to participate in the leadership process, to be part of a team, but to delegate, too. Leadership for a TVET for sustainable development implies the ability to shape one's environment sustainably, to question one's own and the others' behaviour and attitudes, to accept different opinions and to recognise and manage conflicts. These competencies have been tried to be brought together in the above summarised module to contribute to building the next generation of sustainable leaders.

References

- Barth, Matthias (2007): Netzwerke und Kooperationen für eine Bildung für nachhaltige Entwicklung. <http://www.bne-portal.de/coremedia/generator/pm/de/Ausgabe__001/Downloads/04 __Kooperationen_20und_20Netzwerke/M._20Barth__Artikel.pdf> [Zugriff: 07.11.2009]
- Bea, Franz Xaver; GÖBEL, Elisabeth (1999): Organisation. Stuttgart : Lucius & Lucius 1999 (UTB 2077).
- Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit (BMU) (Hrsg.) (1997): Agenda 21. Originaldokument der Konferenz der Vereinten Nationen für Umwelt und Entwicklung im Juni 1992 in Rio de Janeiro in deutscher Sprache. <http://www.agenda21-treffpunkt.de/archiv/ag21dok/index.htm > 1997 [Zugriff: 26.07.2009]
- Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit (BMU) (Hrsg.) (2009): Nachhaltigkeit braucht Führung: bewusst – kompetent – praxisnah. <http://www.bundesumweltministerium.de/files/pdfs/allgemein/application/pdf/broschuere_fuehrungskompetenz_nachhaltigkeit.pdf > 2009 [Zugriff: 29.07.2009]
- Diettrich, Andreas; Hahne, Klaus; Winzier, Dagmar (2009): Vocational education and training for sustainable development: backgrounds, activities, initial results. BWP Special Edition 2009, S.53 – 58.
- Fairholm, Matthew; FAIRHOLM, Gilbert: Understanding Leadership Perspectives. Theoretical and Practical Approaches. New York: Springer 2009.
- Ferdig, Mary (2007): Sustainability Leadership: Co-creating a sustainable future. In: Journal of Change Management 7 (2007) 1, S.25 – 35.
- Fünfhaus, Annika (2009): Sustainable Leadership – Ansätze eines Leadership-Trainings für Leadership für eine Berufsbildung für Nachhaltige Entwicklung. Master's thesis, Otto-von-Guericke University of Magdeburg.
- G8 Leader (2009): G8 Summit 2009 – Declaration „Responsible leadership for a sustainable future". <http://www.g8italia2009.it/static/G8_Allegato/G8_Declaration_08_07_09_final,0.pdf> 2009 [Zugriff: 18.08.2009]
- Hahne, Klaus; Kuhlmeier, Werner (2008): Kompetenzentwicklung für nachhaltiges Bauen. In: bwpat Spezial 4 (2008). <http://www.bwpat.de/ht2008/ft01/hahne_kuhlmeier_ft01-ht2008_spezial4.shtml> [Zugriff: 05.12.2009]
- Hargreaves, Andy; Fink, Dean (2003): Seven principles of sustainable leadership.

Dezember 2003 <http://www2.bc.edu/~hargrean/docs/seven_principles.pdf> 2003 [Zugriff: 23.06.2009]
– Kremer, Manfred (2007): Der lange Weg der Nachhaltigkeit. In: BWP 5 (2007), S.3 – 4. <http:\\bibb.de/dokumente/pdf/a1__bwp_05_2007_kommentar.pdf> (Zugriff: 17.09.2009)
– Kultusministerkonferenz (KMK) (2007): Handreichung für die Erarbeitung von Rahmenlehrplänen der Kultusministerkonferenz für den berufsbezogenen Unterricht in der Berufsschule und ihre Abstimmung mit Ausbildungsordnungen des Bundes für anerkannte Ausbildungsberufe. <http://www.kmk.org/fileadmin/veroeffentlichungen_beschluesse/2007/2007_09_01-Handreich-Rlpl-Berufsschule.pdf> 2007 [Zugriff: 23.11.2009]
– Leithwood, Kenneth; RIEHL, Carolyn (2003): What we know about successful school leadership. <http://forms.ncsl.org.uk/media/F7B/98/randd-leithwood-successful-leadership.pdf> 2003 [Zugriff: 15.11.2009]
– Lokale agenda Planet 21 (2009): Visionen und Leitbilder erstellen. <http://www.planet21.ch/handbuch/handbuch.php?id=11&table=compendium&origin=handbuch.php&user=&session=&> 2009 [Zugriff: 20.10.2009]
– Majumdar, Shyamal (2006): Integrating sustainable development in TVET curriculum. <http://www.unescobkk.org/fileadmin/template2/apeid/Conference/11thConference/papers/5E3_Majumdar.pdf>
– Schaltegger, Stefan; KALISCH, Claudia (2006): Sustainament MBA Sustainability Management. In: Tiemeyer, Ernst; Wilbers, Karl (Hrsg.) (2006): Berufliche Bildung für nachhaltiges Wirtschaften: Konzepte – Curricula – Methoden – Beispiele. Bielefeld : Bertelsmann 2006, S.288 – 302.
– Sustainability Leadership Institute: Sustainability Leadership Principles. <http://www.sustainabilityleaders.org/leadership/principles/> 2009 [Zugriff: 27.10.2009]
– Timmer, Dagmar; Creech, Heather; Buckler, Carolee (2007): Becoming a sustainability leader: IISD's role of shaping the next generation of sustainable development leaders. < http://www.iisd.org/pdf/2007/sustainability_leader.pdf> [Zugriff: 07.11.2009]
– UNESCO-UNEVOC (2006): Orienting Technical and Vocational Education and Training (TVET) for Sustainable Development. A Discussion Paper. Prepared by the UNESCO-UNEVOC International Centre for Technical and Vocational Education and Training, Bonn 2006.
– United Nations (1987): Our Common Future: Report of the World Commission on Environment and Development/ Brundtland-Report. <http://www.un-documents.net/wced-ocf.htm> 1987 [Zugriff: 23.07.2009, 16:15 MESZ]
– United Nations Economic Commission for Europe (2005): UNECE Strategy for Education for Sustainable Development. High-level meeting of Environment and Education Ministries, Vilnius, March 17 – 18, 2005.

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Transfer Research to the Chinese TVET Teacher Training Project

Abstract

In this article, the Chinese TVET teacher training project focusing on the German action learning concept being conducted in Germany is introduced. This project focuses on the different research approaches "Policy Transfer" as well as "Transfer of Innovation" in the context of educational science which will be presented and the research deficits argued. In the third section, it is explained why teachers' attitudes and the changing of teachers' attitudes will be seen as the key criteria of the assessment of this teacher training project against different cultural backgrounds.

Background of the Chinese TVET Teacher Training Project

Due to the global competition and rapid economic development in China, there is a large demand for qualified workers. Vocational training in China should continue in accordance with the needs of the labor market. In 2005, the Ministry of Education (MOE) announced the development of a hundred quality vocational colleges to boost China's vocational education. In addition, the State Council decided to invest 10 billion Yuan (about 1.23 billion US dollars) to support vocational education (MOE, 2005).

Teachers from vocational education schools play an important role in preparing and qualifying citizens to meet the state requirements for a qualified national labour force in various vocational and technical areas. In the last few years, different national and international teacher training programs for vocational education have been organized. One of the most prominent of these projects is the teacher training's project, "Developing a national teachers' and headmasters advanced training system for the middle and higher vocational education schools in People's Republic of China". With this project, thousands of teachers from vocational middle schools and vocational higher schools from 2007 to 2010 have completed a six-weeks training program in Germany. Most of the involved teachers are from the following five different vocational fields: constructional engineering, mechatronics, electronics, logistics, and automobile techniques. This training project is organized by the Chinese MOE and the German GIZ (formerly InWEnt). The project is aimed to further qualify the teachers in vocational education schools so that they can meet the rapidly changing requirements in the vocational education in China. During the training, the involved teachers are taught to apply action learning methods in problem-oriented learning assignments.

Action learning was developed in the nineties in Germany and has been implemented to a certain degree within the last ten years. It is an integrated and subject-oriented learning concept in which the trainees are at the center of the learning process. Through the entire action learning process, independent planning, execution and control, technical ability, working methods, and social competence are fostered (KMK, 2007).

It is anticipated that after the six-week training program in Germany, the teachers involved would be able to introduce what they have learned in their classes. The introduction and adoption of the action learning concept is a big challenge to traditional Chinese learning appreciation. Since the implementation of the teacher training project, little scientific research of the practice can be found. Some American studies in the 1920's and 30's indicate that innovation in educational science is implemented much slower than in other fields because the barriers to implementation are especially strong (Rogers/Shoemaker, 1971). A range of issues that influence the transfer process will most likely emerge during the initial stages of the program (Gräsel, 2010). In the next section, the current state of transfer research will be introduced.

Approaches of Transfer Policy and Transfer of Innovation in Educational Science

Currently, different approaches to the educational transfer research are being discussed. Barabasch et al. (2010a, 2010b) devote themselves to the "Transfer-Policy", which refers to using the knowledge and experience of others. They investigate how relevant the lessons from the educational policies are to their own country. This concept was widely used as the foundation of international development work. What has been transferred, are the basics of educational organization, structure, legality, and regulations. A successful transfer depends on an initiative changing and internalization from the countries on the receiving side. In this sense, Barabasch et al. analyzed the development of the German dual vocational education system in Egypt, Korea and Malaysia. This development follows the macro structural level or so-called regime level. The motive, structure, process, types and results of transfer are discussed to some extent. However, detailed investigations of policy transfer are still required.

Based on the international research of transfer in educational science, Gräsel, Jäger and Willke (2006) developed a systematic, comprehensive concept of "transfer of innovation". Transfer of innovation could be defined as dissemination of innovations in educational systems, which is mainly concerned with new concepts, scientifically based knowledge, and techniques concerning educational development. The current German representatives of transfer of innovation are Gräsel (2006, 2010), Nickolaus (2010) and Jäger (2004, 2008). Transfer in the educational studies has only recently been systematically investigated and consequently little knowledge is currently available. Referring to Jäger (2004) "transfer" will be understood as

- the planned and controlled transfer of knowledge
- from a context A, which consists of the characters content, person and social system
- to a context B, which differentiates at least in one of the three characters.

This means that the knowledge should be transferred from context A to context B. In context B the following elements are possibly changed: (1) content: the new knowledge, which will be applied through innovation in new schools; (2) persons: the involved persons, who will adopt the innovation; (3) social system: the organizational structure of the schools, such as responsibility, regulations, norms, and values.

The acceptance of an innovative social system by transfer research in educational science always follows the same process as follows: In the beginning, few people adopt the innovation. These people are the so-called "early adopters". The innovation spreads rapidly from a certain threshold of dissemination and eventually slows down as the "late adopters" take over the innovation (Gräsel, 2010).

Because of its complexity, transfer is improbable and doesn't operate automatically. It can, however, succeed and be promoted under certain conditions. The factors that influence the transfer innovation process in education science need to be analyzed. Referring to numerous innovation transfer sources, Gräsel et al. (2006, 2010) and Nickolaus (2010) outline the factors that facilitate or accelerate the transfer process. To summarize, it can be described in two dimensions:

Relevant structural influence factors to transfer innovation:

- school administration
- applicable curriculum
- sufficient resources
- openness to the development process
- quality of the project management
- reform climate in schools
- Sustainable evaluation approach

Relevant personal influence factors to transfer innovation:

- anxiety and resistance against school development
- willingness to take part in further teacher training
- willingness to sustainable self qualification and self evaluation
- difficulty with unforeseen problems
- skepticism to the practicality of the program under the given conditions
- the involved teachers take advantage of the innovation in the practice
- motivation of the teachers
- suitable multipliers
- qualified knowledge of the concept
- collaboration with colleagues in and outside their schools
- The innovation is in accordance with the existing values, convictions and subjective theories of the individual teachers or schools,

The profound research of the process of transfer of innovation shows that it lacks evaluation of the model projects (Gräsel et al., 2006, p. 549f.). It is obvious that neither the structural nor the personal influence factors are systematically and precisely investigated and defined. This leads to difficulties for operationalizing the influence factors and for evaluating the effects of the model project. In

addition, the influence of different cultural backgrounds as well as international development work is not of particular concern. Furthermore, until now there are few differentiated criteria to assess the success of the transfer. Sufficient indicators for evaluating a successful transfer project in an educational system are needed. In the next section, what can be considered as the essential indicators to the success of the transfer according to the teacher training's project and how the indicators relate to the influence factors in transfer of innovation will be discussed.

The TVET Teacher Training Project and Transfer research

The Chinese TVET teacher training project mentioned in the first section focuses on a modern teaching and learning concept – action learning. Now, through various teachers' training projects, the Chinese vocational education teachers try to learn this action learning concept in Germany and apply it later in their classes. The content to this transfer project is the action learning concept, which could be understood as new knowledge conditioned by certain political frameworks. While Gräsel et al. (2006) concentrated on the transfer of innovative knowledge, which is strongly related to individual understanding, Barabasch et al. (2010a, 2010b) paid attention to the transfer of policies attributable to systems and regularities in international context. Therefore, both theoretical approaches could substantiate this teacher training project from different aspects.

Sufficient experience shows that transfer in the education system is a difficult process. Even in an open and innovative society, it takes a long time to accept a new idea. For example, the public schools in USA needed about 50 years to accept the idea of Kindergarten. In the 1960's, they took almost six years to launch the modern mathematics program (Gräsel et al., 2006, 470). As for development work, Korea and Malaysia have both tried the German dual-system of vocational schools, but failed despite long years of collaboration and abundant financial assistance (Barabasch et al. 2010a, 2010b). Whether innovation transfer has actually been adopted or not depends primarily on the receiver. The teachers must accept and apply this innovation (Desimore, 2002).

This teacher training project involves two countries – China (receiver) and Germany (offerer), which have completely different cultures, values, and political systems. Different values and educational understanding root from their historical and cultural backgrounds. The clash of the east and west culture is one of the biggest issues for the educational exchange (Wang, 2006, p. 115; Xu, 2003, p. 87, Gräsel et al. 2006, p. 544). Spiel et al. (2009, p. 241) emphasize that ideologies and values influence the acceptance and execution of scientific knowledge. The educational field transfer of scientific based innovation will be strongly influenced by cultural-shaped knowledge, traditional values, and attitudes. Therefore, an investigation of teachers' attitudes will turn out to be necessary to transfer research in development work.

Moreover, in the last years, scholars have argued about indicators to a successful transfer. Usually, a widely spreading is viewed as the most important indicator of a

successful transfer. Coburn (2003) criticized it as short-sighted considering it refers to quantitative dissemination but not a qualitative changing. In contrast to superficiality, Coburn indicated in his publication a "deep" indicator for a successful diffusion, which emphasizes a changing of teachers' persuasion and action pattern in their classes. Regarding the theoretical model from Gräsel et al. (2006, p. 544), teachers' attitudes towards innovation can be viewed as an essential influence factor of teachers' behaviour in their class and is one of the prime characteristics of personal factors which influence the success of the transfer. Consequently, against different cultural backgrounds, teachers' attitudes towards action learning are a crucial factor of influence to implement action learning methods in their classes, and the changing of teachers' attitudes towards innovation in transfer projects should be scientifically investigated in this teachers training project

Like other concepts, there are several definitions and descriptions of attitude. Allport (1935, 810) defines attitude as "a mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related." Several definitions of attitude (Fishbein et al. 1975; Wilson, 1971, Rosenberg et al., 1960; Krech et al, 1962) have the following general characteristics:

- an individual's prevailing tendency to respond favorably or unfavorably to an object
- strong context outcomes, relative to other related concepts such as motive
- rooted in experience
- developed through slow interactions, well established and enduring
- changeable with more learning and experience
- can be divided into cognitive, affective, and behavioral components.

Based on these attitude theories from a social-psychological aspect, and the action learning theories from educational psychological theories, a comprehensive questionnaire to teachers' attitudes towards action learning will be developed in a dissertation based study. In this survey, teachers' attitudes towards action learning, which is seen as the prime personal influence factor, as well as the changing of the teachers' attitudes towards action learning, which is regarded as the "deep" indictor (Coburn, 2003) to a successful transfer, will be further studied.

Résumé

Gräsel et al. (2006) criticized that transfer processes in educational transfer projects should be better systematized and operationalized. For example, personal factors should be analyzed and monitored to assess the effect on the transfer of innovation. The attitude of teachers is a prime example of a personal influence factor to the transfer of innovation in educational science. The changing of teachers' attitudes after the transfer projects is viewed as a "deep" indicator to evaluate the transfer of innovation (Nickolaus, 2010; Coburn, 2003), which has not been investigated in either Germany or other countries (Gräsel, 2010). Based on the research of Gräsel et al. (2006) and Nickolaus (2010), this article substantiates a subject of further investigation – teachers´ attitudes

and the changing of teachers' attitudes to action learning – for transfer of innovation research according to the TVET teachers training project. In the coming research, teachers' attitudes and the changing of teachers' attitudes towards action learning will be systematically and precisely defined and investigated.

References

- Allport, G.W.: Attitudes. In: Murchinson, C.A. (Hrsg.) (1935): A handbook of social psychology. Worcester (Mass.), 798-884.
- Barabasch, A./Wolf, S. (2010a): VET Policy Transfer in Ägypten, Malaysia und Korea. In: Neue Forschungserträge und Perspektiven der Berufs- und Wirtschaftspädagogik. Schriftenreihe der Sektion BWP der DGfE. Opladen: Budrich. 123-134.
- Barabasch, A./Wolf, S. (2010b): Die Policy Praxis der Anderen. Policy Transfer in der Bildungs- und Berufsbildungsforschung. In: Zeitschrift für internationale Bildungsforschung und Entwicklungspädagogik, 4, 22-27.
- Coburn, C. (2010): Rethinking scale – Moving beyond numbers to deep and lasting change. Educational Researcher, 2003, 32(6), P. 3–12. In: Gräsel: Transfer und Transferforschung im Bildungsbereich, in: Zeitschrift für Erziehungswissenschaft, März 2010.
- Desimore, L. (2002). How can comprehensive school reform models be successfully implemented? Review of Educational Research, 72, 433–479. In: Gräsel: Transfer und Transferforschung im Bildungsbereich, in: Zeitschrift für Erziehungswissenschaft, März 2010.
- Fishbein, M./Ajzen, I. (1975): Belief, Attitude, Intention and Behaviour: An Introduction to Theory and Research London: Addison-Wesley Publishing Company.
- Gräsel C./Jäger M./Wilke H. (2006): Konzeption einer übergreifenden Transferforschung und Einbeziehung des internationalen Forschungsstandes, in: Nickolaus R./Gräsel C. (Hrsg.): Innovation und Transfer – Expertisen zur Transferforschung.
- Gräsel, C. (2010): Transfer und Transferforschung im Bildungsbereich, in: Zeitschrift für Erziehungswissenschaft, März 2010, S. 7.-20.
- Jäger M. (2010): Transfer in Schulentwicklungsprojekten. Wiesbaden: VS Verlag für Sozialwissenschaften.
- Jäger M. (2008): Wenn Ideen Schule machen. Anregungen zum Transfer von FörMig-Prinzipien und bewährter Praxis. Münster: Waxmann.
- KMK (2007): Handreichungen für die Erarbeitung von Rahmenlehrplänen der Kultusministerkonferenz (KMK) für den berufsbezogenen Unterricht in der Berufsschule und ihre Abstimmung mit Ausbildungsordnungen des Bundes für anerkannte Ausbildungsberufe. Bonn, Sekretariat der KMK. (Fassung vom 2007).
- Krech, D./Crutchfield. R.S./Ballachy, E.L. (1962): Individual in society. A textbook of social psychology. New York.
- MOE, (2005): http://www.moe.gov.cn/edoas/website18/24/info34024.htm, 20.07.2010, 12:53 Uhr.

- Nickolaus, R. /Gönnenwein, A./Petsch, C. (2010): Die Transferproblematik im Kontext von Modellversuchen und Modellversuchsprogrammen, in: Zeitschrift für Erziehungswissenschaft, März 2010, S. 39.-58.
- Rogers, E. M./Shoemaker, F. (1971): Communication of innovation. A cross-cultural approach, New York: Free Press,.
- Rosenberg, M.J./Hovland, C.I. (1960): Cognitive, affective and behavioral components of attitudes. In: Rosenberg, M.J. et al. (Hrsg.): Attitude organization and change. New Haven, 1-14.
- Singer R.: Einstellung und Einstellungsmessung. In: Willimczik, K. (Hrsg.) (1985): Forschungsmethoden in der Sportwissenschaft, 2. Auflage, Hamburg: Verlag Ingrid Czwalina,. S. 135-164.
- Spiel, C./Lösel, F./Wittmann, W. (2009): Transfer psychologischer Erkenntnisse in Gesellschaft und Politik. Psychologische Rundschau, 60(4), , 241–242. In: Gräsel: Transfer und Transferforschung im Bildungsbereich, in: Zeitschrift für Erziehungswissenschaft, März 2010.
- Wang, Victor C.X. (2006): Chinese Knowledge Transmitters or Western Learning Facilitators Adult Teaching Methods Compared, in: Edited by: King P. K./Wang Victor C.X.: Comparative Adult Education around the Globe,.
- Wilson, G.D. (1971): Einstellung. In: Arnold, W. et al. (Hrsg.): Lexikon der Psychologie, Bd. 1. Freiburg, 447-454.
- Xu, Shuo (2003): Vom Buchwissen zur Handlungskompetenz – Ein Lernkonzept für die chinesische Berufsbildung am Beispiel der Zerspannungsfacharbeit. Aachen (Shaker Verlag).

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Master's Degree for Secondary Vocational School Teachers: a New Mode to Train Teachers of Vocational Education in China

With the increasing demand for middle and advanced skilled talents and for improving the overall quality of urban and rural workforce in China, vigorously promoting vocational education has become an inexorable trend. Since 2002, vocational education in China has entered a new stage of rapid development. While the scale of schooling is experiencing constant increase, the key issue still remains: only by improving the quality of teachers of vocational education, can we develop the quality of talent fostering and cultivate the characteristics of vocational education. Nevertheless, most teachers in secondary vocational schools are with lower educational background; young teachers, especially those with master's degree are difficult to find for supplement; teachers who have been working in vocational school for years are facing the task of updating and improving their knowledge. Therefore, it becomes an urgent task to advance the educational level of teachers in vocational school and to train high-level and "double-technique" teachers of vocational education. After the approval of the Ministry of Education and the Academic Degree Commission of the State Council, the State Council Academic Degree Committee Office launched the Cultivating Program for Secondary Vocational School Teachers to Take In-Service Master's Degree (short for MA for SVS) in 2000. From then on, promoting secondary vocational school teachers to pursue master's degrees has become the key to enhance these teachers' quality and to establish a training system of teachers of vocational education

Significance of the Cultivating Program for Secondary Vocational School Teachers to Take In-Service Master's Degree

The new century has witnessed rapid development in science and technology, and also the constant improvement of technological content of various industries. "What the society really wants are talents with knowledge and skill, which need to be taught by their teachers. Therefore, the quality of teachers turns out to be a critical factor. Especially in the current stage, the scientific and technological development and the adjustment of industrial structure bring about new demand for knowledge updating and competence of talents." Given these, teachers should not only possess theoretical capability and be familiar with the latest development in their own profession, but also have the ability to integrate new theories and technologies with their teaching. This ability can not be achieved by one-shot training; it relies on constant efforts of teachers themselves and higher level of education.

Secondary vocational education doesn't require students to master very advanced theory, whereas knowledge to be learned and equipment to be used should be updated with time and scientific development. Against the background of the expanding scale of secondary vocational education, teachers of secondary vocational schools usually have to shoulder heavy teaching tasks and have no time for renewing knowledge. Therefore, the knowledge of some professional teachers is becoming obsolete. Considering this situation, the Vocational Education Department of Ministry of Education and the State Council Academic Degree Committee Office decided to carry out programs aiming at updating knowledge and providing life-long education for teachers in vocational schools. One of these programs is to promote teachers in secondary vocational schools to pursue their master's degree. The implementation of this program is beneficial to the training of young and middle-aged backbone teachers and academic leaders of vocational education, to the construction of high-level teaching cohort as well as to the sound development of national vocational education cause.

Progress of the Cultivating Program for Secondary Vocational School Teachers to Take In-Service Master's Degree

Approved by the Vocational Education Department of Ministry of Education and the Academic Degree Commission of the State Council, the official document "the Notification of Implementing the Cultivating Program for Secondary Vocational School Teachers to Take In-Service Master's Degree" (Department of Vocational and Adult Education, 2000) was issued. According to the notification, altogether thirteen institutions of higher learning were chosen, including Tianjin University and Tongji University, to systematically select qualified teachers in secondary vocational schools (including regular vocational schools, vocational senior high schools, adult secondary school and technical schools) to pursue their master's degree on the job. These teachers are chosen by recommendation, self-application and examination, and the program aims to train them into backbone teachers and academic leaders. In 2001, the Academic Degree Commission of the State Council issued the notice No. 31 [2001] — "Opinions on Formulating the Cultivating Program for Secondary Vocational School Teachers to Take In-Service Master's Degree". In 2004, the First National Seminar on Discipline Construction and Graduate Students Training of Vocational and Technical Education was held in Jinhua, Zhejiang Province by the Academic Council of the Chinese Vocational and Technical Association. It focused on issues like training mode of graduate students, faculty resources and teaching quality. And in 2006, the School of Sciences and Technologies of Hunan Agricultural University conducted studies and discussions on the cultivating program for secondary vocational school teachers to take in-service master's degree, the development mechanism and mode innovation and training curriculum of vocational school teachers in the world. These three conferences discussed the above program from the viewpoints of the topic, plan, goal and model of graduate students cultivation. From starting-up of this program in 2000 to 2005, there were 4637 secondary vocational school teachers in five batches pursuing their master's degree on the

job. Thereafter, in 2006 the enrollments totaled 861; the planned number of enrollments was 1180 in 2007, 1665 in 2008, and 1945 in 2009. Until 2009, altogether 33 institutions of higher learning have launched the program, and the number of majors that take in students has increased from 39 to over 100 now. The program basically covers the six main regions in China and all key disciplines of secondary vocational schools. It not only meets the teachers' demand of pursuing further education near to their home, but also decreases the cost of training. (See List 1)

List 1 Recruitment of the cultivating program for secondary vocational school teachers to take in-service master's degree

Recruiting Institutions / Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Tianjin University	3/90	3/90	4/120	4/120	4/120	5/160	4/140	5/50	2/30	5/70
Tongjin University	3/90	—	4/80	4/90	4/90	5/90	4/70	4/40	1/20	4/60
Southeast University	3/90	3/90	4/120	4/120	5/140	—	—	—	—	—
Xi'an Jiaotong Universtiy	3/90	3/120	4/110	3/80	1/40	1/40	1/40	1/10	—	—
Harbin Institute of Technology	3/90	3/90	4/80	2/50	1/30	—	—	—	—	—
Xiamen University	3/90	4/120	4/110	4/120	4/120	6/140	6/110	5/50	3/30	2/30
Yunnan University	3/90	3/90	4/80	4/80	4/100	4/100	5/100	4/40	4/50	5/65
Hunan Agricultural University	3/90	3/90	3/60	2/40	3/50	3/70	2/60	3/30	2/30	3/40
Sichuan Agricultural University	3/90	3/60	3/45	—	—	5/50	5/25	—	—	—
Jinlin Agricultural University	3/90	3/90	3/60	2/40	3/50	—	3/60	4/40	2/40	3/30
Northwest Agricultural and Forestry University	3/90	4/120	3/45	—	—	4/40	—	—	—	5/40
Dongbei University of Finance and Economics	3/90	3/100	3/90	3/100	3/120	3/120	4/110	6/60	5/80	6/80
Harbin Commercial University	3/90	3/90	2/40	2/40	3/60	3/55	4/70	5/50	4/60	6/70
East China Normal University	—	—	—	2/60	4/130	5/125	5/110	5/50	2/40	2/40
Beijing Normal University	—	—	—	2/60	3/60	1/30	1/40	2/20	2/30	—
Ocean University of China	—	—	—	2/60	2/80	2/80	5/110	5/50	4/60	4/45
University of Electronic Science and Technology	—	—	—	2/60	3/70	3/70	3/80	3/30	3/40	3/50
Huazhong University of Science and Technology	—	—	—	3/80	4/100	5/90	4/75	4/40	5/100	5/100

Zhejiang University of Technology		—	—	—	2/60	3/90	4/120	4/110	6/60	5/100	4/60
Zhejiang Normal University		—	—	—	2/60	2/90	4/100	4/100	4/40	2/30	2/30
Chongqing Normal University		—	—	—	2/60	3/100	4/120	5/100	6/60	5/100	7/110
Fujian Normal University		—	—	—	2/60	3/60	4/60	3/45	3/30	4/50	4/55
Hebei Normal University		—	—	—	2/60	2/60	2/60	2/60	5/50	3/60	3/50
Yangzhou University		—	—	—	2/60	2/80	2/60	6/100	5/50	7/120	5/90
Hunan Normal University		—	—	—	—	2/50	4/70	5/90	6/60	5/75	5/80
Hubei University of Technology		—	—	—	—	2/60	5/110	5/90	5/50	4/50	4/80
Northwest Normal Universtiy		—	—	—	—	3/60	5/90	4/80	5/50	4/40	6/60
Shandong University of Technology		—	—	—	—	3/60	3/60	5/110	6/60	4/60	6/70
Jiangxi Agricultural University		—	—	—	—	2/50	3/65	3/60	3/30	2/30	4/40
Guizhou University		—	—	—	—	2/60	4/80	4/65	3/30	3/40	3/50
Shanxi University		—	—	—	—	2/60	2/60	2/60	2/20	2/30	3/40
Xinjiang Agricultural University		—	—	—	—	—	3/60	3/50	3/30	5/60	5/55
Beijing Institute of Technology		—	—	—	—	—	—	—	—	2/40	9/90
Tianjin University of Technology and Education		—	—	—	—	—	—	—	—	3/50	7/105
Inner Mongolia Agricultural University		—	—	—	—	—	—	—	—	5/50	5/50
Guangxi Institute of Technology		—	—	—	—	—	—	—	—	3/30	2/30
Shaanxi University of Technology		—	—	—	—	—	—	—	—	4/40	4/40
Hebei Normal University of Science and Technology		—	—	—	—	—	—	—	—	—	4/40
Total	**Number of Institutions**	13	12	13	22	29	29	29	28	32	33
	Number of Majors	39	38	45	57	82	104	111	118	111	145
	Number of Enrolments	1170	1150	1040	1560	2240	2375	2245	1180	1665	1945

Notes: Such numbers in cells like '3/90'mean that the institution plans to recruit 90 students in three majors. Harbin Commercial University is the previous Heilongjiang Commercial College which changed its name in 2000.

It can be seen from the above list, that the institutions of higher learning which have launched the program mainly include two types. In the first category are those with distinctive strength on certain disciplines (engineering, agriculture, economics and so on), most of which are engineering colleges like Tianjin University and Southeast University. A major part of the institutions that the Ministry of Education has approved for recruitment belong to this type. The other category includes regular normal universities that have got the permission later, like Beijing Normal University, East China Normal University. Tianjin University of Technology and Education got the official approval as the first vocational normal college involved in the program in 2008. These two types of colleges have their own strong points. Engineering colleges can integrate their strength on engineering disciplines with related majors of secondary vocational schools when setting up training goals and curriculum; besides they show distinctive features in improving application ability. On the other hand, normal universities pay more attention to teacher education courses, showing overall advantages in theoretical, managerial, and policy aspects of vocational education. They can help to raise the theoretical quality of secondary vocational school teachers.

Since the launch of this program, altogether 16.570 teachers of secondary vocational school have proceeded to master's degree on the job in ten times. Among them, thousands of secondary vocational school teachers with master's degrees have taken on their teaching posts. It can be seen that the program has won initial success, with a basic training system taking shape. Furthermore, some importance achievements and experience have been obtained in the process of practice and training system construction.

Institutional Arrangement of the Cultivating Program for Secondary Vocational School Teachers to Take In-Service Master's Degree

Guiding Ideology

On the whole, under the guidance of Marxism, Mao Zedong Thought and Deng Xiaoping Theory, the cultivating program for secondary vocational school teachers to take In-service master's degree should be based on Regulations Concerning Academic Degrees in the People's Republic of China, Vocational Education Law of the People's Republic of China and Teachers Law of the People's Republic of China and in accordance with the basic requirements for graduate students training. With the focus on overall improvement of the political quality, professional skill and teaching ability of backbone teachers in secondary vocational school, the cultivating program should aim to foster young and middle-aged professional backbone teachers and specialty leaders to the end of building a high-quality teaching cohort excellent in vocational education and finally promoting the sound development of vocational education in China.

Recruitment

Enrollment

The cultivating program for secondary vocational school teachers to take In-service master's degree primarily admits teachers of specialized courses, teachers of professional basic courses, practice supervisors and other management staff. In order to extend the recruiting scope of the program, the State does not make particular prescriptions for the potential students. All in-service teachers, who have bachelor degree of official national education and are aged below 40, and who have worked as teachers in secondary vocational school over two years and are highly capable in teaching and doing research, can apply for this program. Besides, researchers who have been teaching or doing researches in teaching and research sections at provincial, regional or municipal level for over three years can make applications.

Recruitment

Secondary vocational school teachers who would like to apply for In-service master's degree must take the college entrance examination, which includes political theory, foreign language (English, Japanese or Russian), specialized course and professional basic course. The exam of political theory is composed by individual recruiting institutions; the subject of foreign language is subject to national examination; the composition and marking of specialized course and professional basic course are implemented by each recruiting organization, and the time is the same as the national examination. Specialized course and professional basic course are set on one sheet of paper, which covers basic theories and knowledge of the primary discipline. The full score is 150, and the time for the test is three hours. This test and the national test proceed one by one, and are uniformly organized by provincial department of academic degree and postgraduate education.

Office of the State Council Academic Degrees Committee has gradually let up the enrollment standard of the program. Therefore, the experimental institutions can select excellent candidates according to their own situation. Whereas, the following principles should be met: the number of enrollments must not surpass the planned number; the minimum admission line should be strictly followed; the quality of the enrolled students shall be ensured so as to maintain the status and reputation of the program; all institutions engaged in the program should stick to the principle of fairness and justice, and the principle of admitting only those who are outstanding.

Training Plan

Training Goals

The cultivating program for secondary vocational school teachers to take in-service master's degree is designed to train high-level and professional personnel who meet the needs of the construction of the socialist market economy and to promote the all-round development of moral, intellectual and physical education. Specifically, students admitted in this program are supposed to have a solid grasp of basic

theories and systemic professional knowledge, as well as knowledge and skills that have a direct relation with vocational practice; they should have theoretical basis of vocational education, be able to analyze, evaluate and design the teaching procedures of their major in accordance with the basic law of vocational education, and have the capability of teaching with the aid of modern education technology; besides, they shall be competent of conducting scientific research and management job of vocational education. Meanwhile, they are also expected to master a foreign language. They shall be proficient of reading professional papers and material in that language and possess the ability to listen, speaking and writing. Finally, good physical and mental quality is also necessary for them.

Education system and credit hours

To ensure the class hours of the secondary vocational school teachers who are taking In-service master's degree, the national steering group of the program issued the "notice on ensuring the quality of the cultivating program for secondary vocational school teachers to take In-service master's degree" in 2003. It is clearly instituted in the notice that secondary vocational school teachers who have been admitted in the program to take In-service master's degree should take on the education for 3 years. The time from the beginning of their learning to the oral defense of their thesis should be no less than 3 years and the time for unintermitted learning should not be less than one year. In this program, secondary vocational school teachers take their master's degree on the job, and credit system is adopted. The length of schooling must be not under 3 years and it could be extended to 4 years in particular cases. It should be pointed out that the accumulative length of schooling when students are fully released from work should not be less than one academic year.

Curriculum

The curriculum of the cultivating program for secondary vocational school teachers to take in-service master's degree is designed according to the second-level disciplines prescribed in "List of subjects and disciplines approved to confer doctor' and master's degree and to train postgraduate students" issued by the Academic Degree Commission of the State Council and the former State Education Commission in 1997. The curriculum consists of compulsory courses, compulsory practicing courses and optional courses, and the total credits should be no less than 32. Compulsory courses include public compulsory courses and specialized compulsory courses. It is required that the credits should not be under 20, among which political theories accounts for 2 credits, foreign language 5 credits (basic part takes up for 4 points and specialized part takes up for 1 point), courses on vocational education at least 2 credits, modern education technology 2 credits, and other courses are chosen by students themselves. Compulsory practicing courses account for 3 credits, in which academic report is 0.5, practical skill is 2 and study on teaching reform and practice is 0.5. The credits of optional courses are 9, and they are decided by individual colleges conducting the program.

Teaching Methods

Generally speaking, secondary vocational school teachers admitted in the program to take In-service master's degree are released from work and organized to receive concentrated education in respective training colleges for a period of time (generally at least one year). Some colleges require that in the first academic year, students should go on day release, and then they can resume their former job to work out their master's thesis in the other two years. Some organize students to attend classes in two to three months each semester. In the process of training, some adopt the model of "double elements", which refer to the training college and the college where students work; some take the triple-element model, in which the training college, enterprise and the college that the student works in are involved. Tutorial system is employed for learning guidance, which means that professors or associate professors of the training college are chosen to be the academic tutors of trainees. As to the approaching of teaching, it mainly involves class instruction, aided by discussion between teacher and students and reflection on the part of the trainees.

Thesis Appraisal

The selected topic of the master thesis should be from practical area of its profession, and connected with the teaching practice of vocational education disciplines. It is supposed to have a specific application background and practical value, and can demonstrate the student's ability to adopt the learned theory, method and skill comprehensively to solve practical problems in vocational education teaching. After the selection of topic, the dissertation proposal hearing is held. Only after the approval of expert group consisting of 3 to 5 people, the student can conduct the composition of his master thesis.

The reviewer should focus on the ability of the writer to apply the learned theory, method and skill comprehensively to solve practical problems in vocational education teaching. Academic defense committee usually makes up of 3 to 5 experts with the title of associate professor or above, and includes at lease one expert from outside of the college.

Conferring Degree

Secondary vocational school teachers admitted in the program to take in-service master's degree should be conferred an academic degree, which belongs to master's degree, and also a professional degree, which also includes master of engineering and master of education.

Financial Assurance

The cultivating program requires full tuition, which are mainly paid by the trainees themselves and some secondary vocational schools give some support. Most of the secondary vocational school teachers admitted in this program return to their original working place, and their schools shall give priority to excellent teachers that have earned their master's degree in regards of welfare benefits, promotion and assessment in accordance with actual situation. Given the above reasons, a major part of secondary

vocational school teachers are willing to go on further study on their own expense. In this way, the instructional costs for the program are well ensured.

Management

It is decided in the No.19 [2000] document by Department of Vocational and Adult Education of Ministry of Education that all colleges engaged in this program shall establish organizations, which are led by their leaders, and shall involve related schools and departments like vocational school and graduate school. These colleges should also designate special person to take charge of the coordination. Therefore, the management of the cultivating program is primarily administered by the second-level vocational school of the training college and aided by graduate management department. It is necessary to implement a strict education management, and make detailed regulations about teaching processes, like teaching, attendance, asking for leave and exams. Moreover, special person should be assigned to perform teaching management.

Case Analysis of Implementation of the Program

Institutions of higher learning that have launched the cultivating program mainly include engineering colleges and normal universities. With their own features, these two types of colleges have made some significant achievements and gained experience in this process. Here are two examples selected from these two types respectively for your reference.

Training Practice of Engineering Colleges: The Example of Tianjin University

Tianjin University is a National Key University directly under the administration of the Ministry of Education of China, and also a key university under "211" Project and "985" Project. It is noted for its strong academic and research capability. Established in 1989, School of Vocational and Technical Education is one of the first batch of national key construction bases for teacher training of vocational education approved by the Ministry of Education, one of the teacher training bases of higher vocational education of Ministry of Education, one of the exemplary schools of vocational and technical education under key construction by the Ministry of Education; the leaders' office and secretariat of the expert panel of the cultivating program is also set up in Tianjin University.

Since the launch of the cultivating program, Tianjin University has made noticeable achievement in the aspect of master education for secondary vocational school teachers with the strength of comprehensive advantage of the university. To the end of 2006, altogether 609 trainees in 7 batches have been enrolled in four majors, including educational economics and management, manufacture and automation, control theory and engineering and computer application. And 373 of them have already obtained the degree, becoming the backbone teachers and specialty leaders of their colleges and some promoted to leading posts. They are playing important roles at their own positions.

In practice, Tianjin University has taken effective and advanced measures to train vocational teachers. One example is the major of educational economics and

management. The curriculum set for the secondary vocational school teachers include: theory and methodology of science and technology, English, modern vocational education, contemporary education technology, education theory, education management, educational economics, computer aided management, educational statistics, history of education, educational law, education evaluation, management psychology, computer application software, sociology and so on.

Considering the features of graduate education and In-service learning, Tianjin University sets up separate classes for trainees of this program, and employs teachers who have strong a capability of teaching and doing academic research, and who are proficient in vocational education, as the instructors and tutors of the class. In addition, the university assigns a head teacher to the class to establish good mechanisms and channel for the mutual communication between trainees and the university. These efforts ensure the smooth implementation and coordination of the training program. As to the class arrangement, it is required that in the first two years, trainees should be released from work to go for full-time study for three and a half months each year (that is from April to July in the first year and the same period in the second year). Then, they can complete their degree thesis in their own working place. Trainees can choose their tutors by the two-way choice system, and basically decide their topic when their courses come to an end. The topic should be closely connected to teaching reform and practice of vocational education, and related with their own job as much as possible. Under these efforts, the cultivating program for secondary vocational school teachers to take In-service master's degree has got on the normal track in a short time, becoming an important component of graduate education in the university.

Training Practice of Normal Colleges: The Example of Beijing Normal University

As a National Key University directly under the administration of the Ministry of Education of China, Beijing Normal University is a comprehensive university with the strength on teacher education, education science and basic subjects on liberal arts and science, standing out among normal institutions of higher learning. From 2003, Beijing Normal University started to receive secondary vocational school teachers to take In-service master's degree. At first, there were two majors, namely educational economics and management and educational technology; later vocational and technical education was added in 2004, which took the place of educational economics and management and has become the main major of the program.

Goals of the cultivating program set by Beijing Normal University are that trainees admitted in the program should be up to the standards of master's degree of their major; their basic theoretical quality and capability of performing teaching of secondary vocational school, and their skill of carrying out modern education should be improved. The program is implemented in the mode of part-time In-service study, lasting for 2 to 4 years in two stages, namely course learning and thesis writing. The whole program demonstrates distinctive features of normal education.

The period of course learning adopts credit system (total credits should be no less than 36), and trainees must be released from work and go for full-time study at school. The educational subjects that have been opened include educational theory, vocational

and technical education, education technology, education science research approaches, comparative vocational education, vocational education psychology, curriculum and pedagogy of vocational education and vocational education management.

After passing the exam of the degree course, trainees can do research and study on the job, select a thesis topic and start writing. One example is the specialty direction of curriculum and pedagogy of vocational education, which is the sub-major of educational technology. Basically, the topics for research include: teaching goals and content of vocational education; the relationship between vocational disciplines and professional disciplines; teaching approaches, methods and forms of organization in vocational education; discussion on subject structure and organization authority of vocational pedagogy, and further defining teaching goals and developing typical teaching tasks; defining teaching content and transforming job requirements to learning processes (including profession knowledge and skills, working methods and experience); deciding the teaching approach, methods and form of organization.

Achievements and Experience of the Cultivating Program

Defining Training Goals

During the years of implementation, training colleges engaged in the program have been emphasizing that the trainees should meet the basic requirements set for graduate students, grasp specialized theoretical knowledge and professional knowledge, and master applicable theory and knowledge which are necessary for engaging in vocational education. Therefore, the goal of this cultivating program is to train high-level, double-technique professional teachers of vocational education. With the view to achieve this goal, training colleges should draw up plans with characteristics of training of vocational school teachers, decide the training mode in accordance with actual situation, recruit instructors and thesis tutors sticking to principles, and implement program management strictly to ensure the quality of the talents.

Optimizing the Major Structure

Since the launch of the cultivating program, constant efforts have been put to adjust the recruiting majors with the view of making the program better-directed, more close to actual major setup of secondary vocational school and better meet the needs of teaching cohort construction. Individual training colleges, on the basis of exploiting rules and summarizing experience, improve the training plan, stick to training procedures, and optimize intellectual structure of talents, for the end of meeting the satisfaction of trainees, colleges and administrative departments.

Setting up a Modularized Curriculum

After years of research and practice, the concept of modularized curriculum is proposed with reference to graduate curriculum of vocational school teachers in other countries. The first main achievement is triple-modular curriculum structure put forth by Tianjin University of Technology and Education, which is the mix of general courses, professional courses and specialized courses. General courses consist of theory and methodology of science and technology and foreign language; professional courses

are made up of theory and approaches of vocational education, and professional knowledge and techniques; specialized courses include practising courses and vocational certification courses in line with individual majors. Meanwhile, on the basis of curriculum framework made by the United States, the master's degree curriculum for training teachers of vocational education under the framework of Joint Innovation Plan of Chinese Higher Vocational Colleges (JIP). The modularized curriculum places emphasis on practice and profession, providing an importance basis for the innovation and improvement of curriculum design of this cultivating program.

Implementing Diversified Teaching

Through the years of teaching practice of the cultivating program, flexible and diversified teaching methods have gradually taken shape. Two training models are adopted, namely the model of "double elements", which refer to the training college and the college where the students works and the triple-element model, in which the training college, enterprise and the college that the student works in are involved. With instruction as the main way of teaching, various approaches are introduced into class, like classroom observation, classroom practice, visiting and investigation, teacher-student pairing, topic discussion, problem-based teaching, case-based teaching and project-based teaching. Thanks to these efforts, trainees change their attitude of learning from passive reception to active learning, which allows them to obtain information more effectively and constantly improves their ability to integrate theory with practice.

Regulating management system

It is required that training colleges should implement the program by joint efforts of department in charge of graduate student education, school of vocational education, related schools and departments in charge of teaching as well as other functional departments, and schools of vocational education should perform the overall coordination. The colleges shall set up regulations and rules for the training of secondary vocational school teachers, and coordinate with the tutors to explore the rules of teacher training of new applicable vocational education, for the sake of ensuring the teaching quality. The establishment of a training management system effectively promotes the institutionalization, standardization and scientification of the cultivating program.

Conclusion

The cultivating program for secondary vocational school teachers to take In-service master's degree is a major move in teaching cohort construction of vocational education in China. It creates a promising new model to effectively raise the quality of secondary vocational school teachers. The effect and achievements of implementing this program can be summarized as follows: It has opened a new channel for vocational school teacher training, laying a solid foundation for the construction of an education system

of vocational school teachers; it has realized the goal of improving the academic degree of teachers and expanded the teaching cohort with master's degrees, which helps to promote the teaching quality of secondary vocational schools; it has met the need of secondary vocational school teachers to update professional knowledge, to improve the capability of further learning and doing research, and to reinforce vocational education theory. With these efforts, a contingent of highly capable teachers who have enthusiasm and a deep understanding about vocational education has been produced. Besides, the resource advantage of institutions of higher learning has been integrated with the need of development of vocational education. The discipline structure of the training colleges has been optimized; management has been in good operation mechanism of standardization, systemization and scientification.

The cultivating program for secondary vocational school teachers to take in-service master's degree is a new mode of teacher training in China. As a newborn mechanism, it is still in the exploratory stage. Through years of system construction and practice, some major achievements have been made, and significant experience has been obtained; however, the training system still needs to be improved and some urgent conflicts and problems remain to be solved. Therefore, we should borrow the advanced experience of training vocational school teachers for master's degree in other countries, and meanwhile connect with the specific situation in China to enhance the construction and improvement of the program. We shall increase our efforts to improve and innovate of training model, to do more research on cultivating features, and to improve quality evaluation and control. All in all, we need to explore new ideas and summarize new experiences in practice and to enhance the training quality to promote the program into the track of standardization, systemization and scientification. With these efforts, it is hopeful that a contingent of double-technique teachers of vocational education can be built, which is highly capable, innovative and well-structured, and which covers all principal disciplines of vocational education in China. It will surely play a significant role in reform and development of Chinese vocational education.

References

- Jun Li (2001): A Speech in the Forum of Secondary Vocational School Teachers to Take In-Service Master's Degree. In: Chinese Vocational and Technical Education 5 (2001), p.10-11
- Gang Chen; Fangyan Wu; Mengqing Li (2006): Analysis on the Demand and Impact Factors of In-service Studying for Master Degree of Secondary Vocational School Teachers. In: Vocational and Technical Education 28 (2006), p.22-24
- Wei Shu (2004): Cultivating our Masters: Propositions and Solutions——the Review of the first session of Vocational and Technical Education in Professional disciplines and Graduate Students Cultivating. In: Vocational and Technical Education 18 (2004),p.38-43
- Shineng Liu; Wei Shu (2005):Cultivating our Masters: Target and Pattern. In: Vocational and Technical Education 18 (2005), p.42-47

– Yao Xiao (2006): Cultivating our Masters: Innovation and Borrowing——the Review of the third session of Vocational and Technical Education in Professional disciplines and Graduate Students Cultivating. Vocational and Technical Education 33 (2006), p.32-35
– Zhigang Zhou; Zengwu Li; Hongchun Zhu (2005): Review and Thoughts on Secondary Vocational School Teachers to Take In-Service Master's Degree. In: Vocational and Technical Education 34 (2005), p.21-23
– Shiming Zhu; Zhigang Zhou; Zengwu Li (2003): Working Details on Secondary Vocational School Teachers to Take In-Service Master's Degree. In: Chinese Vocational and Technical Education 11 (2003), p.34-35
– Tianjin University (2007): Carrying out Secondary Vocational School Teachers to Take In-Service Master's Degree, to the Training of Academic Leaders of Vocational Education School Teachers. [Accessed: 22/04/2007]
– Zhaojie Xu etc (2007): The differences and teaching strategies research of Secondary Vocational School Teachers to Take In-Service Master's Degree[J]. In: Education and Vocation 24 (2007), p.25-27
– Specialist Guidance Group Secretariat of Secondary Vocational School Teachers to Take In-Service Master's Degree. Review and Thoughts on Secondary Vocational School Teachers to Take In-Service Master's Degree[R]. Restricted Data of Specialist Guidance Group of Secondary Vocational School Teachers to Take In-Service Master's Degree. [Accessed: 01/12/2006]

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Subject-didactics in the TVET Teacher Education for Secondary Vocational School in China

Background: Subject-didactics and Teacher Education

Subject-didactics refers to "a science of the preconditions, acquisition and application of subject-specific competences" (Fachdidaktikertagung 1985), "a discipline whose theoretical and practical interests are focused on their aims and conditions" (Posch, 1987).

The teacher education consists of three pillars – the subject-didactical course (SDC), the scientific discipline course and the educational discipline course. "Subject-didactics is considered a vocational science for the teacher, and therefore should occupy a central position in the teacher education. This central position of subject-didactics results from its function – it is a connective link between the scientific discipline, educational discipline, and teaching practice" (Bernd, 1997). In this context the task of subject-didactics is connecting the scientific discipline with educational discipline, combining the knowledge – "what to teach" with the knowledge – "how to teach", exploring the theoretical and practical questions of teaching and learning under the subject background. (Fachdidaktiktagung 1985).

SDC in the university study is a fundamental stage of subject-didactical competence training for the TVET teacher. Therefore it is necessary to analyze the status, and find out possible problems of subject-didactical education for the Chinese TVET teachers in order to work out a feasible improvement scheme

Subject-didactics in the TVET Teacher Education and Existing Problems

1 TVET Teacher Education Institutions in China

The institutionalized, systematic vocational teacher education in China began in the late 1970s. At that time with reference to the education mode of general school teachers, the state decided to establish Vocational-technical Teachers Colleges (VTTC), and has taken Orthotype as the dominant mode to educate and train specialized-course teachers as well as practice-instruction teachers of the secondary vocational school (He, 2007). From then on, TVET teacher training strode into a scientific and systematic development stage. Subsequently the amount of vocational teacher-training institutions has gradually increased. Meanwhile, to strengthen the Education and training, some secondary colleges (School of Vocational Education) were set up. Additionally, 50 vocational education teacher training bases were founded relying on universities and schools of vocational education

At present, the TVET teacher education and training institutions are mainly composed of VTTC and Schools of Vocational Education in the comprehensive universities. In terms of the organizational structure, the difference between the two types of institutions is as follows: normally in the VTTC the institute or school of scientific discipline takes charge of the teacher education and training, while in the comprehensive universities the school of vocational education is responsible for it. In terms of the curriculum structure and curriculum content for teacher education, a Ladder-Type Curriculum – public basic courses, basic professional course, professional course, and Additive Model – teacher education course[2] plus scientific discipline course is generally adopted in both types of teacher education institutions. It can be attributed to the background that the education of general school teachers provides reference for the shape of teacher education. From the perspective of scale and achievement, teacher education in comprehensive universities is still in a weak position, and its development is constrained because of lack of attention and huge difficulty in teaching organization administration (He, 2007). By comparison the VTTC have more success than the former in the aspect of teacher education, because they can devote all the available human and material resources to teacher education. So in this article the VTTC will be taken as the research object and primarily the subject-didactical training in these institutions will be studied.

2 Curriculum of TVET Teacher Education and the Module of Subject-didactics

In 1995 the State Education Commission (now Ministry of Education) framed a document–Specialty Catalogue of TVET Teacher Education consisting of 36 specialties, which were included into the Undergraduate Specialty Catalogue of National Ordinary College. Containing two parts-specialty catalogue and specialty introduction, the specialty catalogue has given a unified regulation and description to the name of specialty, training objective, training requirement, main courses, main practice link, educational system and degree of TVET teacher education.[3] According to this document it is required that vocational teacher education is based mainly on undergraduate level with a general four-year training, and the graduates receive correspondent academic degrees, such as engineering, agriculture, management, medicine and so on. After the reform of the credit system[4] the total credits required for graduates generally reach about 180. The curricular structure of teacher education course is also specified in this document, that teacher education course consists of 5 courses, namely vocational pedagogy, vocational psychology, teacher qualification and skill (including teachers' spoken language), textbooks and teaching methodology, and educational practice. Therefore the document has become the fundament of TVET teacher education specialty construction and management. Based on this guiding document and considering its own framework conditions and understanding of vocational education all VTTCs tried to implement

[2] According to the national document - Undergraduate Specialty Catalogue of National Ordinary College (Vocational Technical Teacher Education) (Trial Implementation) , SDC belongs to teacher education course in the curriculum of vocational technical teacher education.

[3] See the Document of State Education Commission (now Ministry of Education): Undergraduate Specialty Catalogue of National Ordinary College (Vocational Technical Teacher Education) (Trial Implementation) , 1995-6.

[4] In the Chinese universities 1 credit is equal to16 class hours, 1 class hour is equal to 45 minutes of classroom teaching time.

it concretely, whereby teacher education course in each VTTC formed gradually respective characteristics. The results of a survey and statistic on teacher education specialties electric and electro mechanic in 7 VTTCs nationwide show that totally 15 different courses that belong to teacher education courses are offered, which can be divided into 6 modules through the analysis of course objective, content and class hours. (See table 1)Table 2 presents the statistical analyzing result of subject-didactical module.

Table 1 Teacher Education Course in the Specialties of TVET Teacher education

Module	Courses	VTTC[5]	Content	Teaching Form	Credits[6]
Education Theory	(vocational) Pedagogy	7	Basic concepts, principles, and methods of education and vocational education	Theory teaching	3 (2), 2.5 (2) 4 (1), 2 (2)
	(vocational) Educational psychology	7	Psychological theories of education and vocational education process	Theory teaching	3 (3), 2.5 (1) 4 (1), 2 (2)
	Methods of educational scientific research	1	Basic methods of educational scientific research	Theory teaching	2 (1)
	Education survey and evaluation	1	Basic concepts, principles, and methods of education survey and evaluation	Theory teaching	2 (1)
Educational Technology	Modern educational technology	5	Based-on multimedia technology teaching media and their development, application, technology of teaching design	Theory teaching is dominant, practical training is subsidiary	2 (4), 1 (1)

[5] The Figures in the table mean the number of VTTC which offers that course.

[6] The Figures in the brackets refer to the number of VTTC that set course by that credit value.

Subject -didactical Theory and Praxis	Microteaching	3	Teaching skill training based on microteaching	Theory teaching in combination with practical training	2 (1), 3 (1) 1 (1)
	Teaching skill training	2	Basic teaching skill training of theory and practice course	Theory teaching in combination with practical training	2 (2)
	Subject-didactic and teaching methodology	3	Teaching design, textbook analysis, organization of vocational education process, teaching methods	Theory teaching is dominant, in combination with certain practical training	1 (1), 2 (1) 1.5 (1)
Teachers' Qualification and Skill	Teachers' spoken language	2	Reaching standard of mandarin Chinese and training of teachers' spoken language	Theory teaching in combination with practical training	2 (2)
	Basic skill training of teachers' spoken and written language	1	Reaching standard of mandarin Chinese, training of teachers' spoken language, ability training of written expression, Chinese character writing	Theory teaching in combination with practical training	1 (1)
	Training of teachers' written language	1	Ability training of Chinese character writing	Theory teaching in combination with practical training	1 (1)
	Teachers' professional morality	1	Education of teachers' professional morality	Theory teaching	1 (1)
Class Advisers' Work	Moral education and class adviser	1	School moral education; theories, skills and methods of class advisers' work	Theory teaching	2 (1)
	Class management	1	Theories, skills and methods of class management	Theory teaching	1 (1)

Teaching Practice	Teaching practice	7	Teaching practice in vocational school (vary from 4 to 8 weeks), sitting in on classes and trial teaching	Teaching practice with the instruction of mentor in vocational school	4(2), 8(1) 6(4)

Table 2 Module of Subject-didactical Theory and Praxis

VTTC[7]	Courses[8]		Total Credits	Percentage in the Total Credits of Teacher Education Course	Percentage in the Total Credits Required for Graduation
1	Microteaching (2)		2	10.0%	1.0%
2	Teaching Skill Training (2)		2	9.5%	1.1%
3	Microteaching (3)	Teaching Methodology (1)	4	25.0%	2.3%
4	Microteaching (1)	Teaching Methodology (2)	3	18.8%	1.5%
5	Teaching Skill Training (2)		2	12.9%	1.0%
6	Subject-didactics (1.5)		1.5	11.1%	0.9%
7	None				

3 Problems and Weaknesses in the Subject-didactical Education

(1)

SDC has a low proportion in the curriculum of teacher education specialty. The survey results show that one of the 7 VTTCs up to now didn´t open a SDC while the proportions of SDC in the curriculums of the other 6 VTTCs prove to be low. As the data in the table 2 describes, the percentages of SDC in the total credits required for graduation in 5 VTTCs are lower than 1.5% except one VTTC with 2.3%. Comparing with the teacher education courses the credits of SDC stand below 20% in these 5 VTTCs. It can result from the "marginalization of teacher education course in the Chinese TVET teacher education" (He, 2007). Presently teacher education courses have a subordinate importance in the Chinese TVET

[7] The Figures in brackets refer the credit values of that course.

[8] ibid

teacher education. From the table 2 we can clearly see that the proportions of teacher education courses always stand below 10%, which is significantly lower than the internationally accepted standard — 20%-30% (He, 2007). Thus, we can draw the conclusion that due to fewer credits and lower curricular proportion SDC is ranked in weak position in the Chinese TVET teacher education, and this isn't consistent with its deserved core position in the teacher education as mentioned above.

Table 3 Percentage of Teacher Education Course in the total Credits

VTTC [9]	1	2	3	4	5	6	7
Total Credits of Teacher Education Courses	13.5	14	15.5	16	16	20	21
Percentage in the total Credits Required for Graduation	7.8%	7.8%	7.8%	8.0%	9.2%	10.0%	11.5%

(2)
The SDC contents lack of vocational education characteristics. From the statistical data the small variety of SDC can be full proved, because there are only 4 kinds of SDC in all 7 VTTCs, namely microteaching, teaching skill training, teaching methodology and subject-didactics. Meanwhile in comparison with the curriculum arrangement for the education of general school teachers we can see almost no difference between them, which means that the courses with vocational education characteristics are deficient. In addition, the content of SDC is characterized primarily by general education. The style, structure and expression of SDC can be basically seen as a transformation from the education of general school teachers. The content of SDC can be considered as a copy or "add and delete" of SDC for the education of general school teachers. The main reason is lack of understanding of its own education and teaching rules corresponding to vocational education (He, 2007). Finally, it can be said that the content of SDC has almost no relationship with the subject background, and doesn't deeply explore the teaching practice topics under the vocational and professional background. The discussed questions in the SDC are mainly universal and not discipline-specific. This dissevers the internal relation between scientific discipline course and educational discipline course, and acts against the discipline principle of subject-didactics.

(3)
SDC contents and the teaching practice of vocational education become disjointed. In the investigation SDC module, theory teaching and traditional frontal teaching as a main teaching form and method dominates the course of subject-didactical theory with the aim to teach uninteresting concepts, principles and laws. During the SDC the students have few opportunities to put the theoretic knowledge into real practice, even no chance to evaluate and reflect their own teaching practice and experiences. The practical training orientated SDC refers to the general questions of teaching work

[9] 7 VTTCs have been numbered from 1 to 7.

instead of the main realistic problem in the Chinese vocational education. For example, SDC-Teaching Skill Training in one of these 7 VTTCs has the aim to teach the pedagogical students how to guide the vocational school students to conduct electronic and electrical experiments. And the main form of practical study in the Chinese vocational school is "practical training" (Chinese: Shi Xun), in which the students must design solutions for the work task which is didactically reduced by real work task from vocational practice. There are relatively significant differences between the practical training course and traditional experimental course.

The fundamental reason for the problems in the SDC of VTTC can be attributed to the weakness of vocational subject-didactical research in China. On the one hand vocational subject-didactical research doesn't receive enough attention in the research field of vocational education. An independent subject system of vocational subject-didactics has not been established in the research of Chinese vocational education. On the other hand the research of vocational subject-didactics so far transplants mostly the paradigm of subject-didactics from the general education, and takes the appropriate scientific discipline as its related discipline instead of the "Vocational Attribute" perspective (Jiang, 2005).

The Perspective of Chinese Subject-didactic in the TVET Teacher Education

The Long-term National Program for Educational Reform and Development, which in 2010 was anchored as a guideline for the Chinese education in the next 10 years, put forward to "perfect the teacher professional qualification standard according with the characteristic of vocational education". But in order to perfect the standard exactly these questions must be answered by scientific research: what is the teaching competence standard that accords with the characteristic of vocational education, and how to design the corresponding teacher education system. Thus the vocational subject-didactical research becomes necessary to cope with this issue. In the theoretical research aspect, how to construct the vocational subject-didactical discipline according to the basic attributes of vocational education, which is different from the subject-didactics in general education, has gradually moved into the centre of attention in the scientific research of vocational education. German researchers put forth to construct the vocational didactic based on the frame "vocational science" (German: Berufswissenschaft), and this provides a new idea for the development of Chinese vocational subject-didactics in a certain sense. In the practical aspect, several TVET teacher education and training institutions (such as school of vocational education in Tongji University) have begun scientific attempts, namely Offering SDC that is based on the german concept of "vocational subject area" (German: berufliche Fachrichtung) in the teacher education specialties. These attempts have already brought some positive achievements and accumulated important practical experiences. In the foreseeable future the vocational subject-didactic discipline will certainly obtain great development in China.

Nowadays, vocational education in China is in the fast traffic lane, and is also in a period of reformation. From the perspective of curriculum reform, the Chinese vocational education stands in a reform stage from subject-oriented curriculum to work-process-oriented curriculum. This is a paradigm shift of vocational education, and this reform means not only the innovation of teaching objectives, teaching contents, teaching methods and media, but even more a change of teaching philosophy. This represents an unprecedented challenge for he TVET teachers. In order to cope with this change of work-process-oriented vocational education, the question of how to develop the subject-didactical training to improve TVET teachers' didactical competence should be one of the core issues of vocational education research in China.

References

1. Fachdidaktikertagung (1985): Thesen und Forderungen zur Bedeutung der Fachdidaktiken an Hochschulen. Fachdidaktikertagung am 04. 12. 1985. Oldenburg: Universität
2. Posch, Peter (1987): Fachdidaktik in der Lehrerbildung. In: Altrichter, Herbert u. a. (Hrsg.): Gräßle, Erwin; Nayer, Rainer (Hrsg.): Berufspädagogik und Religionspädagogik im Dialog. Düsseldorf: Patmos.
3. Bernd, Ott (2007): Grundlagen des beruflichen Lernens und Lehrens. Berlin: Cornelsen.
4. He, Wenjin (2007): Reflection and Reconstruction of the Vocational School Teacher Education — a Study Based on Specialization Orientation. Shanghai: East China Normal University.
5. Zhao, Zhiqun (2003): Berufspädagogen in China auf dem Weg zur Professionalität. Bielefeld: W. Bertelsmann Verlag.
6. Jiang, Dayuan (2005): Vocational science: Foundation und Its Position of a New Discipline: Innovation, Tracing and Reflection. Research on the Development of Education, 2005 (3)

Part B:

Recent Developments in the TVET system in China

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On Theoretical Orientation of the Group Running Model of Vocational Education in China

As a burgeoning strategic choice of Chinese education during the period of economic transformation, education group is a new model resulting from the reform of educational organization and arrangement of education system.

The debuting of Chinese educational group on a large scale started in the early 1990s and developed along two parallel ways, one led by civilian-running educational group and the other by state-running group. These two ways of educational group running have their own separate and distinct traits.

The Group running model of vocational education which blazes new trails in the organization and system of vocational education is branded with Chinese characteristics and agrees with the country's basic condition. It is an original, new and directional strategic choice for the development of vocational education. As far as its concept is concerned, the group running model of vocational education can be interpreted from at least two aspects, that is, the group running model of education and the group running model of vocational education. In general, as education is the superordinate concept of vocational education, the concept of the group running model of education is supposed to cover that of group running model of vocational education in spite of their certain corresponding relationship. The educational group in the concept of group running model of vocational education usually refers to the group running phenomenon in general education, but many organizations with the name of educational group, civilian-running educational group in particular, often involve multiple education types and different education stages. Therefore, the review of this research must include the general research situations of the closely related group running model of education and the group running model of vocational education. In terms of organizational traits, the group running model of vocational education is a Chinese characteristic collective organization that aims to promote the in-depth cooperation between school and company.

In order to further the development of the group running model of vocational education, it is necessary to give an accurate definition and demonstration of it in theory. To start with, we should correctly determine the way in which theoretical study and analysis about this topic are carried out; and then we must sum up the theoretical foundation for this kind of school running mode; the third, a deep and thorough exploration should be done about the Chinese characteristics of this running mode and the last, we must come up with an in-depth summary about the remodeling of several important relations in vocational education.

Chinese characteristics of the group running model of vocational education

In 2005, Prime Minister Wen Jiabao said in the national working conference about vocational education that "China is doing the largest vocational education in the world. We must take our own way, emancipate our mind and advance with times. We should explore in practice a way with Chinese characteristics to develop vocational education". The Group running model of vocational education is exactly an important theoretical and practical innovation with Chinese characteristics made by Chinese vocational educators in the vocational education system during their search for a characteristic Chinese developing road.

Fitting in with Chinese market-oriented economic system and development, the group running model of vocational education is the only way towards a collective, massive, intensive chain development.

With the reform in market economy system and the economic development in China, the market is supposed to play a fundamental role in resource allocation under the macro-control of the socialist country. Accordingly, the core concept of the strategy of strengthening China through human resource development is to establish a talent raising system and mechanisms that agree with market economy under the guidance of scientific view of talents so as to foster a climate with market-oriented human resource allocation where talented people successively come in large numbers and give full play of their talents. In this way, it provides a strong guarantee of talents and wide intellectual support to the Socialist cause with Chinese characteristics.

For a long time, under the restriction of historical conditions and systems, Chinese vocational schools didn't have a proper arrangement about a number of things like the scale of development, course setup, and layout of school and disciplines. This condition, for one thing, has caused the shortage of education fees, and for another, led to the serious waste of education resources that further results in low school running profit, lowly qualified talents and inadequate market orientation of human resource allocation.

The Group running model of vocational education is a collective, intensive, large-scale chain developing way to solve the above mentioned problems. It integrates and amplifies vocational education resources and carries out the policy of win-win cooperation, the strong complementing the weak, cooperation among schools, cooperation between school and company and cooperation between city and town. Various effective forms are used to realize educational resource sharing and restructuring so that limited funding can produce more profit and that educational resources are optimally distributed. The cooperative schools, companies and industries are able to obtain what they need for their development such as knowledge, skills, talents, information and funding aid during the cooperation process. Consequently, the quality of talents cultivated by vocational school is enhanced and the allocation of skilled talents becomes more market-oriented.

The Group running model of vocational education is an innovation in the management system, operating mechanism and school running mode.

Since China is a country transforming from planned economy to market economy,

the management system, operating mechanism and running mode of vocational education have plenty of troubles to be rooted out. On one hand, a weak centralization on a vaguely-divided multi-department system leaves the regional vocational education organizations fighting their own battles. Hence, being ineffective and resource-consuming, the vocational education cannot, to any degree, adapt to local economy and social demands. On the other hand, in the Runner-&-Administrator system, under the over-supervising of the departments, the vocational schools lose their autonomy. And without public participation, the lack of market intervention results in the great imbalance of supply and demand. Therefore, the out-of-date management system, operating mechanism and school running mode can never fit into the economic growth and requests of reform, thus are facing challenges.

The Group running model of vocational education is an innovative model to deal with above mentioned problems. Based on the needs to develop regional economy, it makes full use of industry, companies and social forces to effectively integrate vocational education resources and establish an operating mechanism that is market-oriented, flexible, open and autonomous. This model breaks the past rigid management system of vocational education by following the market law and alters governmental function in management. Companies and the industries play a bigger part in vocational education development and vocational schools gain more liberty in school running. Meanwhile, the more flexible operating mechanism is multi-oriented, multi-management, multi-faceted cooperation and benefits many participants. During the process, the vocational education group guided by the market demands aims to promote the sustainable development of social economy by supporting educators' life-long career development. It has produced various forms of school running models.

The Group running model of vocational education is a major move to further enlarge the scale of Chinese vocational education, improve vocational education quality and make vocational education develop fast and soundly.

In the current situation, vigorously developing vocational education meets the requirement to speed up the industrialization and modernization of China and provides an important way to boost employment and helps to solve issues of agriculture, farmers and rural areas. While perfecting the modern national education system, it serves as an important measure to provide more job opportunities and possibilities to all kinds of graduates. Therefore, we must further improve the national education system and develop vocational education fast and soundly.

At present, the scale of Chinese vocational education is expanding rapidly and hits a record high with 18,000,000 undergraduate students. To keep the fast and good development of vocational education, we must pay high attention to the improvement of education quality as the education scale is enlarged. The Group running model of vocational education is an effective way to coordinate the roles the government, industries, companies, and vocational schools play in vocational education. In particular, it can fundamentally achieve the integration and optimization of regional, domestic and foreign vocational education resources by changing the role deficiency of industries and companies in vocational education development that has lasted for a long time. In this

way, the model continuously improves the quality of vocational education and market allocation of talents. Following the industry regularity, the group running model of vocational education brings the group business model into vocational education and strengthens the connection between schools and school and company so that with the integration and sharing of education resources, vocational education improves a lot in both quantity and quality and brings about the fast and sound development.

The theoretical foundation of the group running model of vocational education

Scientific Outlook on Development is the basic theoretical foundation of group running model of vocational education, which from the beginning until now has been emphasizing that vocational education must be guided by the Scientific View of Talents and stick to a strategic development that is comprehensive, coordinate and sustainable. Besides, this model obviously takes the theory of specialization as a guiding principle.

Follow the basic rules for the development of modern vocational education

As an important way to construct a vocational education system of Chinese characteristics, the group running model of vocational education is the specific implementation and demonstration of the basic principles for the development of modern vocational education which, according to a general survey of vocational education in countries all around the world, is to meet the demands of regional economy on talents, establish a cooperative mechanism between school and company maintained by certain rules, provide courses and teaching modes that foster the effective combination of learning and studying, and carry out a complete market access rules of labor and a system of professional qualification certificates.

In essence, the group running model of vocational education in China is a very beneficial exploration and trial during the process of constructing modern vocational education system and operating model. Abiding by the basic principle of modern vocational education development, it is the only way to form a mode with Chinese characteristics where vocational schools cooperate with industries and companies to cultivate highly qualified laborers.

In the first place, the group running model of vocational education realizes the cooperation and win-win relation of regional vocational education resources, leading to a closer relationship between vocational education and regional economic development. It reaches the target to establish a good and close interaction between vocational schools and social economic departments.

Secondly, by means of innovations in relevant system, management and mechanism, this model uses the interactive relationship between vocational schools and companies to cultivate and train all kinds of skilled people that satisfy the needs of social economy development and consequently to enhance the economic profits of vocational education. It puts into practice the theory of combination of learning with studying, with teaching and with study and research. The mechanism of cooperation between vocational

schools and industry in talent cultivation is ensured by an effective system.

Thirdly, the group running model of vocational education, on the one hand, brings about a low cost and low risk expansion while still keeping all the advantages of the brand or the core school so that it strengthens the radiating effect of high-quality vocational education resources and stops effectively the wasteful fight over enrollment between industries and schools; and on the other hand, it integrates superior education resources and promotes the development of vocational schools in both quality and quantity. Thus, industries and companies can be guaranteed with continuous provision of laborers and intellectual support.

Compliance with the operating mechanism of labor market in socialist market economy

The Group running model of vocational education is a sustainable talent cultivation model that agrees with the operating mechanism of labor market in socialist market economy. At present, China is in the process of constructing and developing a socialist market economy. With economic growth and the furtherance of the reform and opening-up policy, the Chinese labor market becomes more and more mature as the total employment keeps going up and employment structure becomes more diverse. The pressure of employment in cities and towns is alleviated and the number of surplus-labor in countryside dwindles a lot. The perfection of operating mechanism of Chinese labor market is still in process with the establishment of a series of systems, such as employment inspection, early warnings about unemployment, wage investigation, post classification and vacancy inquiry, helping to strengthen basic abilities of labor market. It solves the inner conflict in labor market between supplies and needs that the absolute figure of labor is very large while the shortage of skilled talents with high quality is still severe. As a result, the unification of labor market is enhanced and the urban-rural division phenomenon gets solved.

Based on the demands of the labor market, the group running model of vocational education facilitates the fluent communication between school education and enterprise personnel by means of fostering cooperation between schools and between school and company. Various forms of school-company cooperation support multiple tailored educations that enhance vocational education's ability to boost employment and diminish unemployment.

The Group running model of vocational education responds to the ever-increasing demands of Chinese current labor market on technology capital and creates a "superior brand" of vocational education that promotes the integrated and coordinated development of regional education resources. Moreover, it improves the quality of regional labor force and lays the foundation for solving the shortage of skilled talents with high quality.

In addition, vocational education groups implement the principle of city helping town and the strong helping the weak, and achieve the integration of dominant education resources in both city and town. Through providing rural students and surplus-labor with access to vocational education, the urban-rural division of labor is continuously mended and the unification of labor market is enhanced.

Follow the basic rules to cultivate skilled talents with high quality

The basic target of vocational education is to cultivate skilled talents with high quality competences of different levels and different categories. The development law of vocational skilled talents states that the cultivation of skilled talents must be market-oriented, employment-targeted, quality-based and skill-specialized and that the principle of combining learning with working and practicing must be followed. The above expounded basic rules for cultivating skilled talents call for both a communication mechanism between vocational education and industries and good interactions among regional vocational schools. This has been proved by the development history of international vocational education.

At present, as an important measure to promote the favorable interaction between vocational schools and industries in China, the group running model of vocational education aims to improve the mode and method for cultivating talents in vocational education. In the course of constructing and developing vocational education groups, the basic rules for the cultivation of skilled talents are taken into consideration and guide the integration of resources available, leading to the realization of superior vocational education.

The remodeling of four relations by the group running model of vocational education

Although currently the group running model of vocational education is still in the primary developing phase, it has already remodeled four relations that have been in urgent need of improvement in the developing process of Chinese vocational education for a long time.

Remodel the relation between school and company

For quite some time, it has been the bottlenecks in developing Chinese vocational education to push forward the positive interaction between vocational schools and companies and to give full play to the cooperation among learning, practicing and researching in cultivating skilled talents with high quality. Group running model of vocational education offers an effective way to solve the problem. Grounded on the administration and guidance of the government and relevant leading departments of the trade, this model makes both school and company as main school fosters and sets up a constructive partnership that implements the win-win principle and that is based on shouldering relevant responsibilities. While facing one or more professional posts that are generated by the needs of production practice, students are helped to obtain direct production experience and vocational life experiences and become skilled and practical talents that excel in one special skill or possess multi-level high qualities. It achieves seamless joining of needs and supplies as well as zero distance to employment. It may be said that as a significant reform in vocational education system, the group running model of vocational education brings about profound changes to the relation between vocational schools and companies in that it changes the centralized relation into a diversified one.

First of all, it is reflected in the diverse ways of cooperation between vocational

schools and companies. In the group running model of vocational education, vocational schools and companies break the single corresponding relation and form a multi-crossing one. The model can serve various purposes. First, it makes schools cooperate with companies closely and in multiple ways in school running; secondly, it counts on companies to carry out the combination between teaching and practising; thirdly it enables both the cooperation between strong partners and the advantage complementation cooperation. And then, it supports schools to make use of regional advantages to cooperate with the company group in school running. The above mentioned purposes give rise to different types of vocational education groups that are led either by schools, or by companies, or by industries. In the next place, schools and companies have a diversified and in-depth cooperation that extends to organization culture, talent standard, course design and teaching model in addition to enrollment, recruitment and fund cooperation. This change greatly boosts the merging between education means and production methods. Thirdly, it is exhibited by the blend and harmony between school culture and business culture. Breaking through the original school running method, the model adds the function of profession building to education which with its other traits of cultivation and humanization enables students to enjoy the double nurture of both spiritual schooling and vocational schooling and subsequently gain an inner harmony between literacy and skill.

Remodel the relation between work and study

The Group running model of vocational education brings about a significant reform in profession construction, course development mode and teaching mode in vocational education. It links work closely with study. The model is guided by the principle to make study and work combine and blend with each other. It thus breaks the situation when profession setup, course design and teaching model were detached from practical work and realizes the goal to cultivate skilled talents with high quality.

The relation between work and study in vocational education is remodeled from many aspects. First, in terms of teaching content, both working and studying become the prescribed content of teaching schedule to promote students' operational ability and learning capacity. Then, working and studying are united together. Secondly, students are expected to shoulder responsibilities and obligations corresponding to the working post as professionals. Students also identify themselves as workers. This leads to the change of students' role. Thirdly, it requires students to study in vocational post and practice in studying environment. Working post and class are combined into one. Fourthly, it requires teachers to be articulate and practical. With both theoretical knowledge and actual operation ability, teachers are working masters at the same time.

It is of practical value and significance to remodel the relation between work and study. For one thing, the closer relation between vocational education and labor market enables schools and companies to cooperate in multiple ways to reform profession setup, course design and teaching model and reach the goal of employment-oriented vocational education. For another thing, by combining students' working with studying, it cultivates students' operational ability to the full extent and realizing the aim of making vocational education oriented towards students' career development.

Remodel the relation between secondary and higher vocational education

The Group running model of vocational education improves the connection and union of secondary and higher vocational education. At present, the main way to unify secondary and higher vocational education is through joint school running, five-year higher vocational education and enrollment with the specialty. So to speak, the combination of secondary and higher vocational education is a bold and rewarding try in reforming educational system in the group running model of vocational education. Within vocational education groups, secondary and higher vocational education of different school periods and different teaching levels are joined together to form an educational system that is progressive and continuous.

This remodeled relation between secondary and higher vocational education obviously has practical values and significance. Starting from the system construction, the combination of secondary and higher vocational education further social meanings since it asserts graduates of secondary vocational schools the right to have higher vocational education. This not only helps to popularize higher education in China and get rid of corrupt customs of despising both physical work and vocational education, but also offers a new developing road to people who resolve to take vocational jobs.

In the second place, the remodeling of this relation which favors the development of secondary vocational education provides a stable and upward stretching student resource for higher vocational education to enlarge its scale and enhance the education quality. Thus, the aim is achieved to see coordinated development and progress of regional secondary and higher vocational education.

Thirdly, the remodeling of this relation helps to lower the education cost and reduce repetitive course setup and skill training. The connection between secondary and higher vocational education can effectively decide the curriculum and course content so that the relations between rudimentary knowledge and specialty, between theory and practice, between current job and life-long study are reasonably handled, forming a continuous and progressive course system from secondary vocational education to higher vocational education. Meanwhile, the connection is able to allocate education resources as a whole in accordance with the principle of less input, more output. In vocational education groups, personnel, equipment and sites are arranged in terms of different demands of secondary and higher vocational education on teaching and practical training and in a way that makes the best of limited vocational education resources.

Fourthly, it favors to cultivate talents in the light of vocational qualification certificate instead of by a strict distinction between secondary vocational talents and higher vocational talents. Within the education groups, teaching methods should change with the traits and needs of secondary and higher vocational education with a good grasp of the relation between secondary and higher vocational education. Based on students' interest, the groups teach students the right professional attitudes, knowledge, and skills. In the meantime, scientific evaluation about professional quality and skill grades should be stressed with consistent and strict standard in order to ensure the qualification and quality of talents. This evaluation system contributes to the enhancement of secondary and higher vocational education.

Remodel the relationship between different regions

As the group running model of vocational education requires educational resources to integrate and optimize among regions, it is a beneficial exploration of the running mode of Chinese vocational education breaking regional barriers. This model encourages the cooperation in setting up chain vocational schools across national borders, regions, industries, and cities and towns. By making vocational education meet the needs of regional economy, it serves and promotes the development of regional, western and rural economies. It obtains evident practical values and significance through integrating and allocating the regional vocational resources in China.

First, the regional integration of vocational education promotes the development of social economy through advocating the communication and sharing of education resources, skills and talents among areas that differ in their economic development. In China where regional economies develop unevenly with huge disparities between urban and rural economic development and which has cultural diversity, the regional combination and development of vocational education help to spread and extend advanced cultures and productivity in highly developed area to backward areas. In this way, some very promising economic development projects can combine with local human and natural resources to form new productivity and production relations, ensuring a good and fast transformation of production and development mode. During the spreading and extending process of advanced cultures and productivities, since discrepancy usually means opportunities and multi-elements breed characters, economies and cultures of different characteristics will crash each other, communicate with each other and finally merge together into new unique economies and cultures.

Second, the regional integration of vocational education optimizes resource allocation by reducing repeated constructions, and brings about intensified vocational education advantages that will improve the competitive edge and influence of regional vocational education.

All in all, the group running model of vocational education is of Chinese characteristics and based on solid theoretical foundation. It possesses clear historical and practical values in advocating and improving the theories and practising patterns of Chinese vocational education.

References

- Suhua Guo (2005): Thoughts on Optimizing of Operational State of Vocational Education Group.In: Exploring Education Development 10 (2005)
- Chengrong Ma (2005): Reflections on the Basic Issues of Vocational Education Group. In:Exploring Education Development 10 (2005)
- Seminar of Report on Issues of Chinese Education and Human Resources. (2003): Stepping from Large Country in Population to a Powerful Country in Population. In: Beijing: High Education Press 2003

– Liu Yang; Yuping Yi (2007): A Review of the Studies on Vocational Education Group in China. In:Communication of Vocational Education 2
– Fang Cai (2007): Growth and Structural Changes in Employment in Transitional China. In:Economic Research Journal 7
– Yinsheng Zhao; Jingsong Wu (2007): Grand Vocational View and Reform in the Regional Vocational Education Management System. In:Chinese Vocational and Technical Education 5
– Xiuqin Yu (2008): Connotation and Development Process of Vocational Education Collectivization. In:Chinese Vocational and Technical Education 17

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Vocational ability-oriented Pedagogy in Chinese Vocational Education

The Positioning of Chinese Vocational Education

Type of Chinese Vocational Education: Competency-based Education

Senior high school education can be conducted by regular senior high schools, vocational high schools, as well as other educational organizations like secondary specialized schools and technical schools, which means that regular secondary education and secondary vocational education are different types of secondary education. Similarly, at the stage of higher education, there are various forms of institutions, including academic universities, engineering universities, applied universities and vocational colleges like vocational and technical institutes. Generally speaking, academic and engineering universities are collectively called regular higher education, and vocational colleges like vocational and technical institutes are classified as higher vocational education. Besides, in line with the goal of talent training two forms of education, namely regular education and vocational education exist which are conducted by different institutions. The difference between types of education is first and foremost indicated by their goal of talent training. The aim to produce practical personnel with the focus on employment is the dominant character of vocational education. Besides, it is supposed to integrate vocational demand of the society with educational needs of the individual. The second difference lies in the content of curriculum. Curriculum reform is the core of teaching reform in Chinese vocational education. Against the background of curriculum reform in vocational education worldwide, some distinctive features turn up in Chinese vocational education. First of all, working positions and tasks become the starting point of the reform. Next, great emphasis is put on competency-based education. Thirdly, extensive cooperation between schools and enterprises is carried out. Fourthly, integrate practice and theory with the focus on working process. At last, module courses characterized by their adaptability, flexible education system and credit system are combined together effectively.

Vocational-ability oriented philosophy based on the concept of all-around development

Chinese vocational education is ability-oriented in nature with the focus on the pursuit of all-around development as required by future world. Vocational ability, or comprehensive vocational ability, is the subjective condition for the individual's living, conducting professional activities and achieving all-around development in modern society. It includes professional knowledge and skills, the ability to analyze and solve

problems, the ability to receive and process information, management skills as well as capability of social communication and constant study. In a word, vocational ability is an integration of knowledge, skills, attitude and psychological features that are necessary to undertake professional activities, which can be divided into specialized vocational ability, universal vocational ability and comprehensive vocational ability.

Vocational ability is obtained based on a broad range of working environments and various forms of vocational labor organizations, and is focused on characteristics of the profession. Professional activities centered on vocational ability are not limited to some special posts or professions but are applicable to post groups or profession groups in a broad sense. Vocational ability with development potential can assist individuals to adjust to changes of occupational environment, support their active construction and adaptation. This ability is acquired by means of training in specific working situations, but meanwhile not constrained by it. In a word, the Chinese vocational education focusing on all-around development attaches great emphasis to obtaining professional skills, the capability of finding methods and social ability.

Development of vocational education against the background of new industrialization in China: technical and human resources

At the present stage, China insists on the basic direction of promoting industrialization by stepping up information in its cause of building an industrialized nation. The focus of this undertaking is put on constructing new industrial structures featured by high technology, high economic returns, low resource consumption, less environmental pollution and good utilization of human resources. Developing the new industrialization is a new choice for economic development strategy of China in the 21st century. China's new industrialization attaches importance to the role of science and technology in the development of productivity, and strives to raise the quality and benefits of economic growth in light of scientific and technological progress and improved quality of workers. It is clear that new industrialization must be founded on the basis of scientific and educational development.

A new mode of production is encouraged in this move, which is distinguished by optimizing and combining various elements, decreasing waste to the maximum extent, lowering cost, and concerning about productivity of integrative factors and development and utilization of human resources. As a key factor of production, technical workers have the responsibility to keep on innovating, progressing and improving their department for the sake of constant development of the enterprise efficiency. From the viewpoint of human resources, the production process should take production department as the basic unit, which has high flexibility and adaptability. Technical workers in different departments should make decisions and deal with routine duties together, being responsible for the whole working process. First of all, it requires workers to possess the objective to constantly improve their manufacturing capability, have a sense of responsibility and self-discipline, communication skills, skill of identifying and solving problem and the concept of taking the working site as the center of their job. Secondly, workers are also supposed to have a comprehensive and profound understanding of professional knowledge in their department, such as operating various

procedures and equipments, knowing the quality standard, being able to maintain the equipment, possessing the capability of technical innovation and being good at settling technical problems. The new mode of production requires the application of scientific principles in production engineering and equipment improvement; and that technical workers should possess advanced theories and technologies (namely, the theorization and scientification of production engineering), strong ability to work on site, adaptability, the capability of generalization, and flexibility of handling various problems. As a result, the key to popularize this new mode lies in producing a number of highly capable personnel, which sets the goal for higher vocational education in China, and also provides space for its development.

In the process of new industrialization in China, vocational education bears the following duties: providing human resources; propelling transformation of scientific and technological achievements so as to improve their application; actively utilizing human resources with the focus on vocational ability and its development in vocational education. A series of measures have been taken in Chinese vocational education to adapt to the new mode of industrialization. First, enhance education in basic (universal) skills and intellectual skills to raise the overall quality of technical-applied talents. Second, make breakthrough in the philosophy of ability that are purely centered on technology, and improve the teaching quality of basic theoretical knowledge. Finally, place the cultivation of students' innovative ability at the core of vocational education and spread the concept in the whole teaching process.

Basic Approaches for Vocational Ability Cultivation of Vocational College Students: Theories and Practice

There are several levels of vocational ability. Basic ability is the first level, which is the universal knowledge and skills applicable to all frontline jobs in a certain profession. By acquiring such ability, individuals obtain the most general skills that are required in all types of work. Then comes professional ability, which means representative knowledge and skills used in all frontline jobs in related professions and occupational groups. Obtaining this ability enables people to get main knowledge and skills so as to work in frontline of related professions. The third level is special ability which is the necessary knowledge and skills required by a particular post of a profession. The individual can acquire the specific learning and ability suitable to a special position. These three levels make up the hierarchical system of vocational ability. The acquisition of vocational ability is a growing process for an employee from a novice to a professional, and has its own rules and phases. The knowledge and skills of an expert connect with the environment of professional activities; therefore, the acquiring of vocational ability should be based on application of knowledge and social practice. The guideline of talent cultivation in vocational colleges is to design training program of knowledge, ability and quality structure with the focus on vocational ability development. This philosophy is embodied in the specialty setting-up, curriculum structure and organization of teaching activities. The training program of vocational education on the basis of

vocational ability is designed by developing professional curriculum after occupational analysis, professional analysis and workforce market analysis. At the same time, it should take the physical and psychological development of students into consideration for the development of regular academic curriculum. Furthermore, special attention should be paid to the integration of actual working situations, which can enable students to generate perceptual knowledge of their profession and make them interested in learning vocational skills. They shall have an overall understanding of their future post and clearly understand the professional knowledge and skills needed. For example, the modern apprenticeship model focuses on experiencing and communicating in actual working environment of enterprises. Professional technicians in these enterprises impart their individual values, behaviors and other kinds of experience to their students imperceptibly, while students under their guidance try to comprehend the skills of these technicians and acquire experience in solving problems.

The core of this program is to make students obtain proficient professional vocational ability, strong ability to cope with their job, and ability to adapt to different posts and professions. In this way, students can cultivate their vocational adaptability in accordance with actual needs after graduation. Colleges, in line with the goal of professional training, shall systematically arrange students to work in the frontline of production and service in enterprises step by step. In the vocation-technology area in modern society, systematic technology plays a decisive role in professional activities. This means we must take the system structure of technology and working organization into consideration so as to solve problems. In order to define the content of study, we must have an overall understanding of the relationship between people and technology. For example, working process-oriented vocational education restructures teaching content in accordance with the order and rule of vocational ability. With the focus on professional work, it imparts working knowledge by means of typical working tasks, and serializes these tasks in line with the development pattern of students' ability.

In professional activities, people should always reflect on their career development objectively and critically. Students in vocational colleges need to gradually acquire the capability of self-regulation and self-reflection through learning relevant experience, and this capability is closely related to their professional activities. Self-regulation ability can promote subject consciousness of students, their initiative and self-discipline in learning, as well as their ability of solving problems. In the stage of ability internalization, we should connect the current knowledge and skills with their learned knowledge structure by means of imagination and practices. In addition, great emphasis must be put on individual differences like motivation of learning, level of ability and types of temperament, with the focus on changing students' attitude and cognitive mode in learning. We are hopeful that students can take their initiative to give self-feedback in learning, find problems and make adjustment in order to improve the effectiveness of study.

Teaching with the Characteristic of Vocational Education

In the field of Chinese vocational education, the model of development in terms of macro system is employment-oriented and for the purpose of better service; the model of talent training in terms of school-operation is characterized by integration of work and study and cooperation between schools and enterprises; and the systemization of working process in the micro level of teaching is the model of curriculum development. With the advancement in the research of teaching methodology in vocational education, two important changes regarding the focus of teaching practice are quite noticeable. The first one is the transfer of the center in teaching goals, namely from the storage of theoretical knowledge to the cultivation of professional ability. This change leads to the shift of teaching methods from teaching-centered to learning-centered, achieving the aim of learning-based teaching. The second change is the transfer of the center of teaching activity, namely from one-way activity (between teacher and students) to two-way activity (not only between teacher and students but also between students themselves). As a result, the methods of teaching gradually change from imparting-based to interacting-based, achieving interaction-based imparting. Generally speak, both regular education and vocational education adopt such teaching methods as lecturing, questioning and answering and discussion. Nevertheless, vocational education attaches greater importance to the cultivation of students' professional ability. In line with the constant development of vocational education in China, we should also improve its teaching methods. Vocational education should focus on the teaching method of imparting indirect experience orally, providing theoretical guidance to the students, including procedures and skills of operation and relevant knowledge. Perceptual knowledge of technical operation is gained through direct experience. The center of this teaching method lies in cultivating students' skills and techniques in the way of practical training so as to equip them with professional skills, which is also the ultimate goal of vocational education.

Student-centered Classroom Teaching

Participatory Classroom Teaching

Centered on students, participatory teaching gives priority to classroom activities by integrating knowledge with these exercises. It organizes activities related to the content of study, guides students to participate and inspires their study initiative. Specifically, teacher divides the students into groups, with 4 to 6 people each; he or she then instructs the purpose of this class, specific goals and the time needed; the teacher assigns students with different roles and starts the activity and discussion; after that different groups make presentation to the whole class in spoken or written form; discussion within a group and communication and exhibition between groups are conducted to reach agreement; at last, the teacher summarizes the achievement of all groups, giving proper evaluation or expectation to everyone.

Inquiry Classroom Learning

Inquiry learning is a learning method whereby students, under the guidance of the teacher acquire knowledge and apply knowledge in the way of choosing a topic and conducting research. Correspondingly, inquiry teaching is a teaching method by which the teachers complete their teaching tasks by leading, encouraging, supporting and guiding the students' inquiry learning. This is a brand new approach of teaching to develop students' innovative spirit and practical ability. Inquiry learning can be applied to all subjects and teaching activities. Teacher is the agent to carry out inquiry teaching, which is for the sake of encouraging students' motive of learning and cultivating their ability to analyze and solve problems independently.

Characterized by openness, exploration, and practice, inquiry learning is a learning process in which teachers, together with students, quest for knowledge by defining research contents, choosing the proper methods, cooperating and communicating with each other for solving problems. The aim of inquiry learning focuses on practical application of learned knowledge and skills, students' learning processes and their practice and experience. Specifically, it aims at providing students with personal experience of participating in research, raising their ability to identify and solve problems and the ability to collect, analyze and use information, let them learn to share and cooperate, and cultivate their professional ethics and sense of social responsibility.

Interactive Classroom Teaching

Classroom interaction is the process of interacting between teacher and students through which a certain change happens, while classroom teaching takes place in a group environment where teacher and students make action in a two-way manner; and interactive classroom teaching is a term given to a teaching strategy in which teacher and students exert influence mutually. Changing the traditional method of students' passive reception of knowledge, this new mode of teaching integrates various elements like teacher, students and pleasant environment in classroom teaching activity for the end of enlightening their mind and promoting the application and creation of knowledge. Interactive seminar-style teaching in designed to encourage students to actively participate in classroom activities, instead of passively receiving, and to help them to form a good attitude of learning, like being good at questioning, being willing to inquire and practise and combine study and application. All in all, it aims at achieving the teaching goal through students' participation and practice.

Interactive classroom teaching is superior to traditional teaching methods and it makes greater demand for both teacher and students. Prior to the class, the teacher should carefully select the teaching content, make thorough research on the teaching object; in the middle of teaching, he or she strives to motivate the class, help the students to experience and guide them to think deeply with the view of raising the quality of English teaching. For example, foreign language teaching places more emphasis on the ability of language use. Interactive teaching, through creating real situation, inspires students' creative spirit and fosters them to cooperate and think independently.

Problem-Based Classroom Teaching

Problem-based learning (PBL), a hot topic among theorists in recent years, is a way of learning that positions students' learning in a complicated and meaningful situation which involves problems to be settled. By working jointly to solve real problems, students learn the implied scientific knowledge and acquire the capability of problem-solving and independent-study. PBL, in its actual implementation, includes the following procedures: teacher organizing problem-solving groups; he/ she posing a problem; students' internalizing the problem; the teacher assigning tasks; putting forward hypothesis; analyzing resources and tasks comprehensively; solving the problem; checking the solution; making reflection and summary.

In PBL, knowledge is a tool of understanding and solving problems. Rather than focusing on problem-solving process, it aims to help students understand the relationship between the present problem and their relevant knowledge and experience, and the mechanism of applying the learned to the question effectively. In the middle and at the end of PBL, students are required to summarize and evaluate their own process of thinking and the result, as well as other students. This is a procedure of enriching and improving the problem-solving schema, enhancing students' ability to generalize knowledge, and finally extending the knowledge obtained in certain case to more general situations. In other words, learners make connection between new knowledge and the old and consciously extract more general information, which effectively prevents their knowledge from becoming stale and over-constraint by situation. By summarizing and reflecting on the problem-solving process, learners get a better understanding of their known thinking and learning strategies, and how to apply the specific strategy to a new task. This is the necessary approach for learners to integrate and use their knowledge to obtain a consistent representation and detailed explanation of problems, and also the basic way of promoting the development of students' ability to solve problems.

Implicit Level-based Classroom Teaching

In a normal class, students show great differences in their basic knowledge and learning ability. It is advisable to divide the class into three levels in terms of learning interest, motivation and ability, without the students' knowledge. Then, the teacher adopts different method to instruct different level of students in the process of class preparation, teaching, tutoring, giving assignment and evaluating. Besides, he or she should take full consideration of the level of students when explaining, questioning, checking, asking for feedback and evaluating. The teacher is expected to mobilize students' initiative and make full use of group cooperation, coordination and interaction, encouraging students of all levels to actively take part in the class.

In this new mode of teaching, the situation that only a few students are involved is changed. Students at all level are enormously motivated. Therefore, their individual characters are able to enjoy full development and their practical skills are greatly improved. More importantly, this teaching mode releases students' learning potential to the utmost extent, making every student content with their achievement and become more confident.

Role Play

The method of role play aims to teach students how to deal with problems through jolting them into action. It involves participants and observer in a real problematic situation, who are eager to get a result. This process provides vivid example to people's actions in real life. Specifically, the teacher can prepare some background material and assign some roles to students. After the role play, he or she asks students to give opinions and organizes the whole class to discuss. At last, the teacher makes a general summary to intensify the positive effect of the role play. For example, in the class of public relation and etiquette, students can practice hand-shaking, self-introduction, exchanging business card and other etiquettes with different roles and in different occasions set by the teacher. In hotel management course, the teacher can arrange such a situation: a customer of a hotel is checking out, but then the waiter finds that a piece of towel blanket is missing when checking his room. Students are asked to play the roles of the customer and public relations officer and handle the problem. This method, which is quite situational and effective in learning result, appeals to students because it is vivid, interesting and easy to implement. Proper application of this method in the education of mental health is of great significance to relieve students' psychological distress and promote the development of their psychological quality.

Case-based Teaching

This method, first used in the legal circle and then by management schools, is introduced in vocational education now. In this method, a teacher organizes students to study, do research and exercise their ability through teaching cases in accordance with the teaching goals and teaching content. Instead of fostering students' ability to explain problems in theory, it aims to turn them into intelligent learners that can solve practical problems, and make them know how to do this and what to do. In addition, in case-based teaching, teacher and students have to shoulder heavier responsibilities, and make more input and participation. For the teacher, he is supposed to select and organize the material for discussion, and choose proper cases from a mass of data. If there is no appropriate case on hand that can cover the content to be taught, he has to make up some by himself and presents them in some way. As to students, they should analyze and discuss the detailed fact and raw material provided by the teacher.

Teachers in their class are advised to select some meaningful cases for students to analyze and discuss. They should encourage students to express their opinions, do research and foster their capability of divergent thinking. This teaching method attempts to change students' attitude from passive learning to proactive learning, and make them voluntarily regard learning as a serious matter. The optimum number of people is 15 for such teaching, because it allows students to exchange opinion and make discussion on the resolution adequately.

Project-based Teaching

Project-based teaching is an instructional strategy in which the teacher and students

collaboratively implement a complete project. In vocational education, a project is a working task aiming at producing a concrete product which is of practical value. Project-based teaching is the most advanced teaching approach in vocational education.

Basically speaking, this teaching method is implemented according to the following stages. The teacher proposes one or several tentative ideas, and through discussion with students, they decide on the final goal and task of the project. Then, students should formulate a working plan of the project, define the working procedures and get the approval from the teacher. They should also determine their own tasks in their group and the cooperative form of their group members, and implement the plan according to the procedures decided. Fourth, self-evaluation of the working outcome is conducted by students themselves, and then the teacher checks and gives a grade. Thereafter, the teacher and students have a discussion on problems arising in the project work, the method that students adopted to solve problems and the characters of their learning behavior. By comparing the evaluation results given by the teacher and students, they should find the reason for the differences. At last, the outcome of the project shall be filed away or applied to enterprises and production and teaching practices. For example, maintenance project shall be kept as maintenance record, and achievement in projects like tools production and software development can be used in production department or daily learning.

Task-based Teaching

Task-based teaching advocates that classes should center on student groups, and motivated by problems or tasks, the teacher and students interact with each other and students cooperate with each other, thus inquiry learning environment is brought about. For example, when instructing installation and maintenance of computer hardware, the teacher is advised to demonstrate the operation, and then with the aid of videotape and courseware, he or she can further show the overall process. Students, after watching the show, are required to operate by themselves; at the same time the teacher gives instruction and corrects their mistakes around the classroom. At last, the teacher is supposed to repeat the operation procedures, call the students' attention to the steps where students tend to go wrong and summarize the key points. For instance, while explaining CPU, the teacher can divide students into several groups and ask them to do research on the price, selection, brands and other aspects of CPU in markets. Finally, each group is required to do a report and make explanation on their report. Other students can make comments, and the teacher shall express his own opinions.

Interest group-based Teaching

It is a teaching approach which divides students into different groups in accordance with their interest and their mastery of the interest. Knowledge and skills are then instructed in line with different situations of different groups. In this way students' initiative and practical ability are enormously enhanced, and every student is able to make some achievement in his or her specific area of knowledge. For example, students majored in computer, may have interest in software development; some may be fond of hardware development and some may be keen on learning application-software. In this case, the teacher can guide them to develop their own interests.

Apprenticeship Teaching

Rapidness, automation and reutilization are the ideal goals of skill learning. For example, when driving a car, the driver is supposed to quickly and precisely identify obstacles and traffic signs, voluntarily control the steering wheel, clutch and accelerator, and perform some actions routinely, like changing the direction, braking, starting off and turning aside. This unutterable knowledge is called tacit knowledge, most of which is acquired in an individual's unconscious and automatic learning process. The concept of apprenticeship emphasizes the importance of experience in learning activity, meanwhile highlighting the nature of learning; that is it depends on background, specific situation and cultural adaptation. Apprentice training is a real application of apprenticeship teaching in operation skill training, including the three procedures of demonstration, practice and retreat. Of course, apprenticeship teaching can be performed not only in skills and operation instruction, but also in intellectual level. Therefore, it includes cognitive apprenticeship, which is created against the background of theoretical research on situational learning. In apprenticeship, emphasis is placed on imitation of experts, which means that experts on site give guidance and model of cognitive behavior to learners, and that activities and social interactions, similar with apprenticeship, are employed to adapt them to practical activities in real situation. Of course, apprenticeship teaching can be performed not only in skills and operation instruction, but also in intellectual level. Therefore, it includes cognitive apprenticeship, which is created against the background of theoretical research on situational learning.

Plenty research works have been done from traditional apprenticeship to cognitive apprenticeship based on situational learning theory, which fully explains the mechanism of cultural adaptation. Thanks to this mechanism, the novices can grow into experts by taking in tacit knowledge.

Ability Module-based Teaching

Ability module-based teaching divides certain vocational ability into several modules, and conducts teaching behavior module by module. And then, comprehensive module training is performed to foster the complete ability of this profession. It is more applicable to teaching of science and engineering subjects; but management and foreign language teaching can also adopt this method. For example, in oral class of business English, the teacher, in accordance with the need of business activities, can divide the teaching material into several ability units, and then subdivide each unit into several modules. The ability unite of dialogue in different roles consists of four modules, that are role defining, knowing each other, making dialogue and reviewing and training. The teacher separates students into different groups, representing receiver and visitor, and asks them to make dialogue in the given situation. Through dialogue, students' ability to listen, speak, read, write and interpret is improved. This method not only inspires students' interest in learning English, but also effectively promotes their competence to use English in business.

Situational Experimental Teaching

Originated in 1920, situational teaching is an improved teaching system developed

on the base of direct teaching. It is proposed in this method that the teacher should purposefully introduce or create vivid and detailed scene to excite some feelings or experience, which can help students understand and obtain knowledge or skills and facilitate the development of their psychological function.

Situational learning has become a typical teaching approach of working-process based vocational education. It is based on learning principles of constructivism. Modern technical workers should not only have the ability to complete definite, prescript, and foreseeable tasks, but also think about the effect they would have on the bigger systematic relationship network. Given this, they are supposed to adopt instructive method to solve definite questions. The focus of this approach is that the created learning situation shall be close to and consistent with the future practical situation. In the experimental teaching, the teacher sets up on-site experiment and carries out on-site imitation in specific project to create real atmosphere of the training content. Meanwhile, the teacher also tries to enrich and specifies the content of training. Therefore, students involved in situational teaching are using techniques to learn instead of learning through techniques; techniques promote and support their thinking and experience construction. In learning, technique plays the role of aid and facilitator.

Application of Modern Educational Technology in Vocational Education and Teaching

Multimedia-aided Classroom Teaching

As a teaching method, modern educational technology has enormously enriched the teaching content, increased the quantity of information, deepened students' understanding of knowledge and enhanced the teaching effect in class. Modern teaching, which adopts multimedia technology as a teaching aid, can fully arouse students' enthusiasm of learning, and exercise their thinking in images and space imagination. The employment of modern technology, represented by computer application not only optimizes students' knowledge structure and change their way of thinking, but also lays a foundation for the mastery of modern scientific knowledge. With the spread of information technology in all trades, it has become a necessary skill of highly qualified workers.

Theoretical deduction courses instruct some theory or formula deduction with the teacher introducing the deduction process and methods. The summary section of this course type should be the cut-in point of modern educational technology, which involves summing-up and generalizing the deduction procedures and approaches of the whole theory or formula. By flexibly switching pictures of the computer, the teacher can make conclusion timely for students.

Skill training courses are set for teaching some skills and explaining the skill operation method to students. Modern educational technology should be applied in the skill operation process. By using computer multimedia technology to imitate natural phenomenon and production process, we can analyze the technical points of operation procedures, and also repeatedly experiment, which enables students to master the

operation skills smoothly and proficiently.

Problem-solving class is a type of specialized class which aims at solving problems and comprehensively using knowledge. Modern educational technology may be applied in the processes of problem demonstration, solution demonstration and operation procedure demonstration. By demonstrating the problem, we hope students can dig into the nature of the problem; through solution demonstration, students are required to discuss and choose methods; procedure demonstration is designed to encourage students to evaluate and consolidate the specific procedures.

Structure design classes provide knowledge of structure designing, structure analysis and structure calculation in specialized courses. Structure demonstration is the part where we can employ modern educational technology. The picture and animation technology in multimedia technology can vividly show the engineering or mechanical structure, inspiring students' thinking and promoting their space imagination. This will lay a solid foundation for the innovation of structure designing.

One of the major goals for exercise and test class is to know how students have mastered the learning knowledge and skills. In this class, the teacher is advised to adopt modern educational technology in preparation of the form and content of exercise and test. Given the interactive, real-time and network-sharing properties of computer technology, the teacher can conveniently prepare various forms of exercise and test and analyze and discuss about students' assignment, so as to timely know the students' understanding of the course and point out their mistakes and shortcomings. With these efforts, the quality of teaching can be consolidated and further improved.

Application of Modern Educational technology in Experiment and Internship Teaching

In experiment class, it is difficult to teach the experiment theory, experiment process description and analysis of experiment structure in traditional teaching methods. However, modern educational technology can work out this problem well.

For example, by applying computer multimedia technology in a chemical engineering experiment, the teacher can describe the reaction course and analyze different results of the reaction vividly and impressively. Another example, it is hard to describe the drying principle of chemical engineering clearly and also hard to observe it in experiment. While, by application of multimedia technology, the teacher could vividly deliver the specific process and achieve the teaching goals. Internship teaching is an important component of vocational education. However, in most time, students can not well grasp some critical content, like key techniques, key equipment and key production process. They only know the surface of the knowledge, so the teaching effect is not satisfactory. With the introduction of modern educational technology to their internship, students are able to understand the key techniques and equipments of the entire factory by means of modern computer simulation; they could even know the inside structure of the equipment or suppose to change production techniques to result in different outcomes. This method can enormously improve the effect of internship teaching, and realize the idea of combining the function of factory and classroom together virtually. For example, modern educational technology has been widely adopted in internship of electronic business and equipment management.

Application of Modern Educational Technology in Course Design and Graduation Design

Course design and graduation design are set up for fostering students' overall ability to solve problems and for instructing design techniques and skills. With the development of science and technology, the design requirements and contents of different majors advance constantly; design methods and techniques and plotting methods and tools also become modernized. Therefore, the process of completing this part of teaching is the process of application of modern educational technology. No matter whether it is in mechanics, architecture or chemical engineering, both course design and graduation design are closely connected with modern technology. With further application of modern educational technology in vocational education and teaching, the professional teaching networking will surely lead to the modernization of teaching content and method. The traditional way of teaching specialized courses in classroom will be completely changed. In modern times, specialized courses are instructed through computer network in computer rooms. For example, the teacher can teach control technology of electromechanical major. Teaching specialized courses by network and multimedia classroom is necessary for the modernization of teaching approach, and also the inevitable outcome of application of modern educational technology. In addition, this kind of teaching practice not only enriches and deepens the content of professional teaching, enormously enhancing students learning of professional techniques, but also poses challenges and the chance of exercise to teachers. Further applications of modernized technology will surely facilitate the connection of professional teaching and production, with the view of promoting vocational education to serve the society in the real sense.

References:

- Dong Lin (2003): The Reform on Teaching about Professional Abilities in Touring Geography Curriculum for Secondary Vocational Schools.In: Fujian Normal University.
- Feng-shan Xiong (2004): Research on the Frame of Executive Capabilities of the Certified Public Valuer in China. In: Heibei University.
- Wen-ying Pang; Da-zhen Xu; Qiao-li Kong (2010): The Development of Vocational Competence Status and Prospect in China. In: Vocational Education Research in Xinjiang 1 (2010), p.69-73
- Guo-ping Jiang; Dong-le He (2010): Cultivation of Vocational Ability from the Viewpoint of Vocational Education Psychology. In: Higher Education Forum 6 (2010), p.113-115
- Zhi-hui Chen (2010): Development and Design of Cultural Basic Courses of Higher Vocational Education Based on Professional Ability Development——The Case of Applied Writing Course of Civil Engineering Specialty. In: Vocational and Technical Education 31(2010) 8, p.20-22

– Huai-kang Li (2009): The Inference and Implement of the Five Key Steps for Fostering Vocational Competence. In: Higher Vocational Education 18(2009)1, p.4-11

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The Development and Reform of Chinese Secondary Vocational Education in the early 21st Century

New Progress in the Development of Chinese Secondary Vocational Education in the early 21st Century

Establishment of a Strategic Position of Secondary Vocational Education
In 2002, 2004 and 2005, the country held three subsequent national meetings on vocational education and promulgated The Resolution of the State Council on Energetically Boosting Reform and Development of Vocational Education, Some Opinions concerning the Further Enhancement of Vocational Education from Seven Departments including the Ministry of Education and The State Council's Decision to Advance Vocational Education, not only defining vocational education as the basement of economic society and the strategy point of education but also clarifying the guiding principles, goals and policies for the revolution and development of vocational education in new era. Governments at all levels are required to take vigorous measures to promote the quick and healthy development of vocational education, which greatly improved the political and social environments for the revolution and development of Chinese vocational education. In particular, Opinions on Accelerating the Development of Secondary Vocational Education issued in 2005 pointed out the developing directions and provided excellent conditions that accounted for the clearing up of secondary vocational education since 2001. The document puts forward the following suggestions: first, vigorously promote civilian-run secondary vocational education and explore various school-running modes such as state running, civilian running, civilian running with government subsidy, public school, shareholding school and Sino-foreign cooperative school; second, further encourage urban secondary vocational education schools to enroll students in the countryside and schools in the east to enroll students from the west; third, make full use of industry and enterprises to develop secondary vocational education by encouraging them to set up vocational schools independently so as to train skill-oriented workforce they need; fourth, strengthen vocational guidance and employment service by establishing and perfecting employment service institute for graduates from secondary vocational schools; fifth, manage and coordinate the admission work in senior secondary vocational schools; sixth, increase the financial input for secondary vocational education from diverse aspects. The goal and task of civilian-running secondary vocational education was further defined by Opinions on Vigorously Develop Civilian-run Secondary Vocational Education issued in 2006.

Rapid Scale Expansion of Vocational Education, especially Secondary Vocational Education and Consequent Ability to Train High Quality Skill-oriented workforce on a Large Scale

In 2008, there were all together 14.767 secondary vocational schools in the nation with an annual enrollment of 8,100,000, which is 4.1 million more than the enrollment in 2001. As undergraduate students reached 20,560,000, the enrollment of secondary vocational education approached that of ordinary high school education in number and improved the universal high school education. More than 150 million people from both city and countryside received various forms of vocational training. In 2007, 38 million farm laborers looking for urban employment received job training, 48 million farmers received applied technology training and 91 million workers went through relevant training. A boom was also seen in community education with 114 experimental community education plots of national grade, 34 demonstration plots and more than 300 provincial experimental plots, all of which together trained 25 million community people annually. Secondary vocational schools have educated 30 million high quality workers and skill-oriented talents for the country since 2001. The employment rate of vocational education increases year by year and reached 96.1% in 2007 while 640 urban and rural people received all kinds of vocational education.

More Definite Secondary Vocational Education Running Idea and Deepening of Educational Reform

The school-running idea has been changed from planned education to market-driven one, from direct governmental administration to macro-control, from traditional school-entry orientation to employment orientation and from discipline-based to ability-based. Closely related to society, market, industry and countryside, the vocational education furthers the education reform by advocating work and study combination, school and industry cooperation, working practice and group developing plan so as to combine its development with economic prosperity, employment enhancement, poverty elimination and advanced culture development and preservation. In the school-running system, the government is the main sponsor while business investment is also taken in to make full use of industry to promote the close cooperation and mutual development of secondary vocational school and industry. To push the establishment of both life-long education and a learning society, equal stress is laid on formal schooling and short-term training, and pre-service education is combined with continuing education. National pilot sites of vocational education reform, mainly of secondary vocational education that are co-developed by provincial governments and the Ministry of Education have been established in Tianjin, Sichuan, Henan, Guangxi and Three Gorges reservoir area since 2005, trying out several significant policies about the reform and development of vocational education in the new period. Specialty setup and courses are also reformed according to the needs of economic society and employment market. Majors of emerging industry and modern service industry are vigorously developed while specialty setup highly meets the demands of job posts. In recent years, secondary vocational schools have kept the employment rate well above 95% with their graduates winning universal recognition from industries and the society.

Continuous increase of budget for vocational education gradually makes secondary vocational education cost free.

In the Eleventh Five Year Plan (2006—2010), central government finance has decided to distribute a 10 billion special grant for the fundamental capacity building of vocational education. Apart from the increase of funding, the state encourages enterprises and public institutions, social communities and citizens to donate money for vocational education. According to the statistics, central government finance has contributed as much as 10 billion RMB from 2003 to 2008 to support the running of 1369 vocational education training bases, 2200 county level vocational centers and demonstration secondary vocational schools as well as 100 national demonstration higher vocational technical colleges. It also carried out the "Plan of Quality Enhancement of Teachers in Secondary Vocational Schools" which trained 100,000 elite professional teachers. Regional efforts were also made to boost vocational education. As a result, the conditions for secondary vocational school operation have been greatly improved under all around concerns and a vocational training organization network is forming that covers city and countryside. At present, the state spends 1.8 billion annually to subsidize students in secondary vocational schools so that all freshmen and sophomores who are from the countryside, counties and poor families in cities can receive 1500 financial aid that benefits nearly 90% of all students while juniors can pay their tuition and life expanse with what they earn from working with studying and internship. The government work report of 2009 pointed out that great effort should be made to develop vocational education, especially the secondary vocational education in countryside. The goal is to gradually realize free-of-charge secondary vocational education, which should begin with rural students from poor families and students studying agriculture-related subjects this year. This free charge policy for secondary vocational education is an important way to put into practice the strategy of developing the country through science and education and talent power, enhance the overall quality of our nationals and turn China's massive population pressure into talent pools. Currently, most students in secondary vocational schools come from countryside and quite a portion of them suffer from poverty and low income. Therefore, poor students from countryside and those studying agriculture-related subjects will be the first to enjoy free secondary vocational education. This measure is of great help to reduce farmers' burden and make secondary vocational education more appealing. Workers of high quality are encouraged to start their own business in countryside, thus improving the structure of labor force in rural areas which in turn fastens the construction of new countryside with modern agriculture and rural economy developed.

Brilliant Achievements in Faculty Team Construction of Secondary Vocational Education

In the new century, a boom is observed in both the number and skill of teachers in secondary vocational schools due to the implement of a series of measures, for example, the provision asking teachers to practise their skills in industries, more flexible personnel system, engaging engineers and technicians, highly-skilled talents as professional teachers or intern guides. "Double-Technique Teachers" took up 12.45% of all full-time teachers

in secondary vocational schools all around the nation in 2005. Until 2006, the number of full-time teachers reached 79,910,000. What's more, the state built a staff training network that was led by national key construction of training bases for staff in vocational education and that was mainly composed of provincial bases. With the support of universities, qualified vocational schools and companies, the Ministry of Education subsequently built 54 such national key constructions of training bases followed by several provincial bases built by regional governments. In order to continuously perfect the staff management of vocational education, the state has come up with a series of documents and corresponding policies within 10 years to ensure the sound development of teaching staff. The documents include the following: Notification about In-service Teachers of Secondary Vocational School Pursuing Master's Degree, On Further Construction of Training Bases for Teaching Faculty in Secondary Vocational Education, On Strengthening Construction of Teaching Faculty in Secondary Vocational Schools during the Tenth Five-Year Period, On Provisions For Teachers in Secondary Vocational Schools to Practise in Companies, Opinions of the Ministry of Education and the Ministry of Finance on Carrying out the Plan to Enhance Secondary Vocational School Teachers' Quality and Guidance about Organizing and Carrying out the Training of Elite Professional Teachers in Secondary Vocational Schools, etc.

New Challenges Chinese Secondary Vocational Education is Facing

Despite the rapid development of Chinese secondary vocational education, it is still a vulnerable spot in the whole education system and has a long way to go to meet the needs of economic and social development and the construction of an innovative country. At present, with its annual enrollment of 8 million students, Chinese secondary vocational education indeed contributes to improve the popularizing rate of high school education, but it barely realizes the basic target of pre-service formal schooling. The rates of in-service training and position transition training are comparatively low, with less than 100 million people each year, most of them come from cities and large and medium-size enterprises. There is a staggering gap between the reality and the supposed standard to train 30% of all workers annually. At the same time, 36.4% of all the in-service workers in China in 2007, nearly 21,400,000 people have only received junior high school education or lower. It is a very difficult job to enhance these workers' skills. Things become worse when it comes to the rural labor force's education and skill level. Of all the 480 million rural laborers, 38.2% of them are with elementary school education or even lower, 49.3% with junior high school education, 11.9% with senior high school or technical secondary school education, 0.6% with junior college or higher education and 9.1% have received professional skill training. This reality gravely hinders the development of the rural economic society, the adjustment of agricultural production structure and farmers' income increase. In one word, much still remains to be done in China's vocational education and training, and as one of its backbones, secondary vocational education is facing new challenges.

Conceptual Error to Overstress General Education While Neglecting Vocational Education

Although relevant regulations in vocational education act deem vocational education as an important foundation for economic and social development and the strategic focus of education, in reality, it is prevalent to value general education over vocational education and investigative talents over skilled ones. The concept of success usually lies in the entry of high school after graduation from junior high school and entry of college after that and only students who have no chance in entering regular schools will apply for vocational schools. This phenomenon results from, on the one hand, inadequate publicity of the importance of vocational education, and on the other hand, the poorly coordinated policies and systems. The main problems of policies and systems are as follows: first, as the labor and personnel system still takes school records as the main standard in employment and recruitment, the public doesn't consider skilled workers as talents whose wages and welfares are not as good as intellectual talents; second, the system of employment access and system of professional qualification certificate are not well executed. In order to lower costs, some companies, especially small and medium ones exploit the excuse that companies have employment freedom and reduce admittance standard of employment to the lowest, which is hard for labor department to supervise. Third, the current admission system has some defects. When high school and universities enroll students, they put the enrollment of vocational school in the last round, misleading the public to think that vocational schools can only get low quality students with poor school record.

Inadequate Input in Secondary Vocational Education that Influences the Schooling

In spite of the increase of national and regional funding for secondary vocational education which more or less brings some improvement to the schooling conditions, the funding severely falls short to appease the pressing problems of shabby facilities and lack of teaching and practising equipments. For several years, vocational schools have continuously expanded their enrollment with no corresponding increase of funding or improvement of schooling condition. Without enough financial grants and an unblocked aid channel from industries and companies, vocational schools tend to charge more fees. There are mainly three reasons for the lack of funding. First, underdeveloped economy leads to weak regional finance resources; second, the lack of student standard per capita funding causes school sponsors to allocate funds at will. The Vocational education act stipulates that vocational school sponsors should appropriate vocational funds in full according to student standard per capita funding that is decided by provincial government. However, only a few provinces have formulated student standard per capita funding or public expense standard which is not based on education cost. Third, current policies are not well executed. The State Council declared in the decisions about developing vocational education in 2002 and 2005 that "The proportion of urban education fees used in vocational education should not be less than 20% in general areas and not less than 30% in areas where nine-year compulsory education has gained ground," and that "Regular companies should allocate 1.5% of workers' gross payroll in full for education and training fees

that count for part of the cost while the proportion should rise to 2.5% for companies with high demand on workers' skill, heavy training tasks and good economic benefits." Nevertheless, many regions didn't put the above stipulations well into practice.

Insufficient Number of Teachers and Irrational Structure of Teaching Group

The construction of teaching group is the Achilles' heel in developing secondary vocational education. There are some major problems. In the first place, vocational schools, especially secondary vocational schools suffer grave vacancy of teachers. According to the statistic of the Ministry of Education, the proportion of the number of teachers in secondary vocational schools to that of students was 1 to 20.3 in 2008, lower than the standard proportions set by the General Office of the State Council in 2001 (The proportion of the number of teachers to that of students in high schools is 1:12.5 in cities, 1:13 in counties and 1:13.5 in countryside.) As the expansion of enrollment scale in recent years, many regional vocational schools are in shocking need of teachers. Furthermore, the structure of the teaching group is not reasonable. Teachers in vocational schools who are mainly recruited from general colleges like normal schools lack working experience and professional skills. An investigation about professional teachers in a higher vocational institute in Guangdong province in 2007 showed that of all the teachers, 34% of them have worked in companies with 8% working for less than one year, 11% for one to three years and only 15% for more than three years, and the rest of teachers have no such experience at all. Another aspect is that two thirds of the teachers in vocational schools in Gansu province don't possess necessary training of professional skills or practical working experience. Double-technique teachers are also in great deficiency, taking up a very small proportion. Another overwhelming problem is the shortage of teachers with middle and senior titles. In 2008, only 32.5% teachers in secondary vocational schools in Gansu province possess middle or senior titles contrasting the 79.5% teachers of second or higher grade in ordinary middle school. Thirdly, instead of having a separate and independent system of title assessment and income distribution, vocational schools adopt the provision and standard of ordinary schools, which fail to reflect the characteristics of vocational education, thus keeping engineers and technicians, highly skilled talents in companies and R & D institutes from joining the teaching group of vocational schools.

Impeded Communication between Secondary and Higher Vocational Education and between Vocational and General Education

The communication between Secondary and Higher Vocational Education and between Vocational and General Education serves as important guarantee to promote coordinated growth of education and to strengthen the charm of vocational education. Currently, there are two problems. First, secondary vocational education is not well connected with a higher one. After graduating from secondary vocational schools, students can hardly continue their study in higher vocational schools. Due to certain stipulations, higher vocational institutes can only enroll 5% students from secondary vocational schools, discouraging parents from supporting their children to apply for vocational schools and students in those schools from learning. Second, the

communication between vocational and general education is not good. Students lack the initiatives to apply for higher vocational schools since it will be hard for them to enter general universities.

Lack of Enthusiasm of Companies to Attend Vocational Education, and Lack of System Guarantee for the Cooperation between School and Companies

One of the essential points for the rapid and sound development of vocational education is to pay attention to the cooperation between school and company. Companies can offer their support in various ways. For example, they can offer internship for students and teachers and be actively involved in the formulation of the school's training objectives, teaching program and syllabus, or they can provide certain equipment for practice. The Vocational education act states that companies and undertaking organizations should provide teachers and students from vocational schools and training institutes with chances to gain practical experience and pay the interns properly. Currently, many regions have carried out this stipulation with active reaction from schools and passive reaction from companies. As for the reasons, there is no clear cut in the responsibilities, rights and profits both school and company should shoulder. Companies have responsibilities but no profits. When accepting teachers and students as interns, the company has to assign special instructors for them and may consequently influence its product quality and quantity. Some companies even have to take risks of broken machines and safety incidents caused by students' insufficient skills. In addition, the state hasn't put forward perfect policies of tax preference and fee compensation.

Hindered System of Vocational Education with Multi-thread Administration and Lack of Resource Integration

The present Chinese vocational education is in the charge of both the Ministry of Education and the Labor Security Department, prone to decentralized management, inconsistent policies, schooling repetitions and resource wastes. Academic education and supervision of vocational qualification certificates answer respectively to the Ministry of Education and the Labor Security Department. This systematic obstacle makes what is taught in school quite different from standard vocational qualification. Within the Ministry of Education, since secondary and higher vocational education are under the supervision of two different departments, there still exists inconsistency between programming and management. The course contents of the two stages are poorly related with each other, which threatens the attempt of making secondary and higher vocational education better connected so as to train highly skilled talents.

Imbalanced Regional Development of Secondary Vocational Education

The imbalanced development of regional economy on the massive territory of China takes its toll on the development of vocational education which undergoes an imbalance between developed areas and underdeveloped areas. The vocational education in countryside and western areas developed slowly. Compared with vocational schools in cities and eastern areas, those in countryside and western areas lag far behind in terms of schooling conditions. Western provinces have a low-level high school education

and even lower level of secondary vocational education, which is caused not only by economic growth and social concepts, but also by macro-control of the government.

The Training Function of Secondary Vocational School doesn't give Full Play.
At present, vocational schools in the country don't undertake much training besides formal schooling. In 2003, there were 72.421.000 people attending non-formal school training and 6.677,5 of them were trained by public vocational and technical training institutions. Only 7,8% of the whole, namely 5.646.000 people were trained by secondary vocational schools, 2.970.000 of whom were students with formal schooling. According to the "Plan of Transferred Rural Labor Training" raised by the Ministry of Education, during the eleventh five year period, 50.000.000 rural laborers who will be transferred to non-agricultural sectors and cities will receive guiding trainings for employment and 30.000.000 of them will have vocational training as 200.000.000 farmers already working in non-agricultural sectors have on-the-job training. More effort should be made by the Ministry of Education to implement its demand on vocational schools' leading role in training transferred rural labor since vocational schools have not fully exerted their resource advantages and potentials in non-formal school training.

Ideas and Major Policies to Advance the Reform and Development of Chinese Secondary Vocational Education

Continuously Consolidate and Expand Vocational Education and Strengthen its Ability to Serve Economic Society
In the coming years, the enrollment amount of secondary vocational education will be roughly equivalent to that of general high schools. It may surpass general high schools in areas which with rapid developing economy have a high demand of skilled talents. The development of secondary vocational education will serve as an augmenter to popularize senior high school education. The enrollment amount of secondary vocational education is supposed to reach and remain about 8.600.000 and the number of undergraduate students will reach 24.000.000. The annual enrollment of high vocational education will exceed 3.000.000 with 10.000.000 undergraduates. The training quality will be enhanced. By carrying out the National Program to Train Skilled Talents, the National Program to Train Transferred Rural Labor, the National Program to Train Rural Applied Talents and the Program of Continued Education for Adults and Training for Re-employment, all kinds of trainings will be launched for urban and rural laborers. The annual training amount of 150 million people will ease the shortage of skilled talents and do good to the development of economic society. To employ the rich resources of vocational education in the eastern areas and cities, vocational schools in east and west, in city and countryside cooperate to have joint recruitment and cultivation so as to provide the western area and countryside with skilled talents they need and close the developing gap between east and west, city and countryside. This is always a very important task in the development of vocational education now and in the future. We should further the construction of vocational education and training network by

promoting "One network and Two Programs". Vocational education centers and schools in the county level, general middle and primary schools in countryside and other rural vocational training institutes will help improve vocational skill training of rural laborers and transferred laborers and practical skill training. An overall plan should be made to make full use of all resources and channels in departments like agriculture, education, personnel social security, science and technology, poverty relief, etc. More funding is needed to build rural vocational schools that provide cultured and skilled talents for the construction of new countryside.

Reform Talent Training Mode and Try to Enhance the Quality of Secondary Vocational Education

To further the reform of secondary vocational education and teaching, the education must be employment-oriented and satisfy the demands of market and society. Meanwhile, in a people-centered education where moral education comes first, moral education should be stressed to equip students with excellent moral quality, necessary knowledge, proficient professional skills and healthy body and mind. Popular talent training mode includes the combination of learning with working, cooperation of school and companies and internship which is supposed to last for one year for students in secondary vocational schools. Majors and courses should be timely adjusted to the development of economic society and the changes in employment market. Accordingly, the teaching mode will go through reform and the system of evaluation criterion is improved. With the perfection of a flexible study system that advocates credit system and elective system, it is more convenient for students to finish their study stage by stage. The system of "Dual Diploma" in second vocational schools should be actively practised so that graduates can gain their academic certificate and corresponding professional certificate at the same time. Employment guidance and service is strengthened and enterprise education should be promulgated to widen employment channels. The public takes part in the monitoring evaluation system for teaching quality in secondary vocational schools. The school running mode is also changed to one with plural participants where the government takes the lead, companies are fully exerted, social partners play an active role and state-run schools and civilian-run ones make progress neck and neck. Companies are encouraged either to continue the running of existing vocational schools or to sponsor vocational education independently or together with other companies and vocational schools. In this way, it ensures the combination of working and learning and the cooperation between school and company. As secondary and higher vocational schools have a clear and definite understanding about their education positions, they are encouraged to enhance their teaching quality imprinted with unique characteristics.

Take Governmental Funding as the Main Income and Collect Fees for Secondary Vocational Schools from Various Channels

To establish and perfect the guarantee mechanism for vocational education development, provincial governments have decided on regional student standard per capita funding. Central and regional finances input more grant into vocational education for basic

capacity construction, hoping to improve the schooling conditions. More of the education budget should be used to develop vocational education. To better carry out the guarantee mechanism for workers' education and training expenditures, the expenditure should be equal to 1.5—2.5% of workers' gross payroll as relevant stipulation requires. Overall plans should be made to allocate resources and money needed for rural transferred labor training and practical agricultural skill training. Poor rural areas and poverty-stricken people are the first to enjoy supportive policies of vocational education, student subsidy policy and practical agricultural skill training. Companies, social communities and individuals are encouraged to make a contribution.

Further strengthen the construction of teacher groups in secondary vocational schools

While speeding up the cultivation of qualified teachers in secondary vocational schools, the teaching group can be enlarged by taking in talents by various means. The proportion of double qualified teachers should be increased. It is necessary to draw up some policies that stimulate technicians and highly skilled talents in enterprises and public institutions to take a full or part time job as teachers in vocational schools. More money should be given to promote teacher training. Some systems should be ameliorated, such as the system of teachers practising in industries and that of professional titles while some need to be established, such as titles of professional and technical posts and evaluation system.

Advocate vigorously the collective school running and innovate the developing mode of vocational education

In recent years, places like Tianjin, Henan, Hainan, Shandong, Fujian, Qingdao and Ningbo which have vigorously explored the way of collective school running possess prosperous vocational schools that are developing rapidly and soundly. Up to now, 25 provinces all over the nation have established more than 200 collective vocational groups with 6000 institutes, 2400 member schools and 3600 cooperative enterprises. It has been proved that collective school running can realize the co-development of school, enterprise and industry through promoting the combination of learning and practicing, the cooperation of school and companies, and internship. What's more, it pushes the resource integration and advantage complementation in vocational education and strengthens the regional and city-town cooperation. As a result, the quality and profit of vocational education is boosted as well as the ability to serve the development of economic society. It fits China's basic condition and meets the demands of development. There are three kinds of cooperation to be strengthened, namely, the cooperation between school and company, between city and countryside and between regions. Cross-regional vocational education groups will be built to help reach balanced regional progress by fastening the vocational education development in the west.

Make Vocational Education More Attractive

To enable the whole society to care about and support vocational education, it is essential to promulgate widely the significance and function of vocational education and advocate

the notion that there are elites in every walk of life. Skilled talents who work in the production line will expect a gradual enhancement of their social status and an increase of the income. There should be special rewarding and motivating policies for excellent skilled talents like giving a big prize and honorary titles to skilled people who have made extraordinary contribution. The connection between vocational education and other forms of education should be seen to so as to build a bridge for the further studying and re-training of graduates from vocational schools. The competitive system in vocational schools should be better implemented to form a situation where the competition game is to vocational education as the entry examination is to general education.

References

- Yao.H. (2008): Future situation, Targets and Tasks in Chinese vocational education. In: Chinese Vocational and Technical Education 23 (2008) 7
- Yao.L. (2008): Situation,Problems and Solutions of Vocational Education Development in China. In: Vocational and Technical Education 29(2008) 19, p.18
- Report on Vocational Education development and reform of The State Council. http://www.chinanews.com.cn/gn/news/2009/04-22/1659160.shtml. [Accessed: 22/04/2008]
- Shu.C.M. (2003): Analysis of 2000-2002 Chinese Secondary Vocational Education Situation. In: Education development reaserch 11(2003)7.
- Ji.Z. (2009): The guidance of scientific concept of development, to achieve faster and better development of secondary vocational education. In: Chinese Adult Education 5(2009)7.
- Ke.M.B. (2009): Development of vocational education brook no delay. Retrieved on August 05, 2008 <http://npc.people.com.cn/GB/9265627.html > [Accessed: 05/08/2008]
- Ji.Z. (2009): Thoroughly implement the scientific concept of development to efforts to make the people satisfied with the secondary vocational schools. In: Chinese Vocational and Technical Education 31(2009) 9.
- Current development of Chinese vocational education reform introduced.< http://www.edu.cn/fa_zhan_283> [Accessed: 16/08/2006]

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Development and Evolution of Chinese Higher Vocational Education

New Developments of Chinese Higher Vocational Education in the 21st Century

Basic Establishment of the Strategic Position of Higher Vocational Education
In June, 1999, it has been decided by the Central Committee of the Communist Party of China and the State Council in "the decision on deepening reform, pushing forward all-round quality education" that higher vocational education is an important component of higher education, and that the State should vigorously develop higher vocational education in order to bring up a large contingent of technology-applied talents with theoretical and practical skills. Later, the Ministry of Education issued the Action Scheme for Invigorating Education Towards the 21st Century, and required that it's an urgent task to actively improve higher vocational education so as to raise the scientific and cultural levels of the nation, promote employment and national economy. Around this time, the State government issued a series of guidelines and policies with the view of stepping up the development of higher education. Thereafter, higher education has entered a historical stage of rapid development, and has become a significant direction and the priority of the national higher education reform and development in the new century. Three national conferences on vocational education were held by the State in 2002, 2004 and 2005, and such official documents as "the decision on deepening reform and development of vocational education" and "opinions on further strengthening vocational education by seven departments including the Ministry of Education", and "the decision on developing vocational education of the State Council" were put forth. In these documents, vocational education is put at a pivotal place in our overall plan of education and is regarded as the mainstay of economic society; moreover, the guiding philosophy, tasks and policies are defined in the reform and development of vocational education undertaking in the new era. In addition, it also requires that local governments at all levels take strong measures to energetically promote the rapid and sound development of vocational education. Under these efforts, great improvement has been made in the political and social environment of the reform and development of Chinese vocational education. It is required in "the Outline of the National Medium- and Long-Term Program for Education Reform and Development from 2010 to 2020" that the State shall spare no efforts to developing vocational education and give it a higher priority. It also points out that the development of vocational education is the key to accelerate economic development, promote

employment, improve people's well-being, solve the issues related to agriculture, rural areas and farmers, and relieve the conflict between supply and demand in work forces, putting higher vocational education high on the government's overall agenda.

Higher Vocational Education Has Been Developed in Terms of Its Scale

Higher vocational education has become an important component in national higher education. According to the principle of vigorously developing higher vocational education by the State, five categories of higher vocational schools have taken shape, including vocational colleges, junior colleges, adult colleges, part of key secondary colleges and subsidiary undergraduate colleges operated by regular institutions of higher learning. From 1999, the State made trail implementation of higher vocational education in accordance with the new management system and operation mechanism. A quota of 100.000 were arranged in the overall enrollment plan of regular institutions of higher learning to carry out experiment of higher vocational education in 14 provinces and cities including Beijing, Shanghai and Hubei. The past decade from 1999 to 2009 has witnessed an increase from 470 to over 1200 of the number of institutions of higher learning, and that the number of students at school grew by 11 times, from 1.170.000 to 11.280.000 (Wu Yan, 2010). It is a contribution of significant importance for improving the labor force structure, especially the frontline labor structure. Until 2009, 310 institutions of higher learning have been approved to set up educational specialties of higher vocational and technical schools, among which 282 are regular institutions of higher learning, 28 are adult institutions of higher learning, and 1030 specialties have been set up with 44 newly established in 2009 (2009 No. 10). This is a change of historical importance for the realization of higher education popularization in China.

The Mode of Talent training of higher vocational education has been gradually defined

In January 2000, detailed measures for the reform of talent training mode of higher vocational education have been put forward in "the opinions on strengthening the talent training of higher vocational and technical education" by the Ministry of Education. The document made adjustments on various aspects, including the change of educational ideology, specialty setup, professional talent training program, reform of courses and teaching content, reform of practical teaching system, reform of teaching and examination method, construction of teaching staff, integration of teaching, production, scientific research and social practice and teaching management. It also decided to implement "the reform and construction program on the training mode and teaching content of higher vocational and technical education in the 21st century". For a better implementation of talent training program, the Department of Higher Education of the Ministry of Education issued the "evaluation system of higher vocational and technical institutions excellent in education and teaching program" (draft) and "evaluation system of higher vocational and technical institutions qualified in education and teaching program"(draft) (2000 No. 149). The evaluation committee of talent training in higher vocational and technical colleges was established by the Ministry of Education in September 2003, with the view to enhance the macro

management and guidance, and promote evaluation of the talent training in such colleges in China. Thereafter, construction and evaluation of pilot higher vocational schools, construction and evaluation of practices and teaching bases, evaluation of pilot specialties of higher vocational and technical school teaching reform and other evaluations have been carried out by the State. In 2003, six state departments (including the Ministry of Education, the Ministry of Labor and Social Security, the State Commission of Science and Technology for National Defense Industry, the Ministry of Information Industry, the Ministry of Communications and the Ministry of Public Health) launched "the training program of skilled talents in manufacturing and modern service industries who were in short supply" in joint efforts. In this program, over 250 higher vocational schools and more than 340 secondary vocational schools were defined as pilot training bases of skilled talents who were in shortage. And in November 2006, "opinions on accelerating the development of national pilot higher vocational schools" were issued by the Ministry of Education and the Ministry of Finance, which required that 100 schools must be established in areas like manufacturing, architecture, energy and chemical engineering, communication and transportation, electronic information, farming, forestry, animal husbandry and fisheries as well as service industry. Meanwhile, a new program of talent training evaluation in higher vocational education was put forward by the Ministry of Education. It also required in the program that the education orientation and innovation progress of these schools should be assessed in accordance with the mode of combining work with study. This program has made outstanding contribution to the promotion of high-skilled talents training according to models of school operation that integrate work and study and cooperation between schools and enterprises.

Noticeable Achievements have been Made in the Project of Establishing National Exemplary Vocational Colleges

According to "the decision of the State Council on strengthening efforts to develop vocational education" and with the approval of the State Council, the project to establish national exemplary vocational colleges should be carried out in the Eleventh Five-Year Plan to set up examples for higher vocational colleges in China. Officially launched in November 2006, the project has established 100 exemplary institutions in three stages, and the first group of the 28 national exemplary institutions has passed the inspection by the Ministry of Education and the Ministry of Finance, making remarkable achievements. The project to establish national exemplary vocational colleges has defined and implemented the idea that higher vocational education is a type of education which features openly running school and cooperation between schools and enterprises; key elements including industry, profession, enterprises and practices should be integrated into higher vocational education program in order to achieve its philosophical reform. In the past three years, the number of enterprises that have established partnerships with exemplary colleges has doubled, increasing from 12.000 to 24.000, a reflection of the exemplary role of the model of cooperation between schools and enterprises in the overall project. Scientific and technological researches made for enterprises by vocational colleges have doubled, with the

total volume of funding increasing from 270 million to 670 million, remarkably strengthening the social service capability of higher vocational colleges (Xie Yang, 2009). The areas that have enjoyed pairing-assistance provided by the exemplary colleges have increased today, and the number of school given pairing-assistance has grown from 460 to 920. This is of strategic importance to the sharing of cross-regional higher vocational education resources of high quality and to the promotion of coordinated development of the program in different regions. Meanwhile, the number of part-time teachers in the exemplary colleges from industry and enterprises has grown from the previous 13.500 to 26.000, with an increase of the class hours from 140.000 to 270.000. This is a symbol that the faculty structure of vocational colleges is being optimized, and the building of double-quality teaching staff has made substantial progress. Besides, high level of student employment in the national exemplary vocational colleges has been achieved, with the employment rate of over 96% in 2009 (Xie Yang, 2009).

New Challenges Facing the Development of Higher Vocational Education in China

Relatively Low Attraction to Higher Vocational Education for the Society

Despite the rapid development of higher vocational education in terms of its scale, its attraction to the society is still a big concern. First of all, generally speaking, most of the students enrolled in vocational colleges are of relatively low score in the national college entrance examination, and a basic college selection procedure has been accepted in the society, with colleges listed in the 211 Project for higher education put in the first place, followed by regular undergraduate colleges and then vocational colleges. Secondly, graduates from vocational colleges are not eligible to take the national civil service examination, and a large number of employers make bachelor degree a basic requirement in their employment, rejecting graduates from vocational colleges. Thirdly, many candidates for the college entrance examination would rather re-attend classes to strive for recruitment in undergraduate colleges, unwilling to enter the vocational college by which they have already been accepted. The registration rate of new students of vocational colleges is only about 80% on average, and not a few choose to drop out. Many reasons contribute to the above problems. The colleges themselves need further development regarding their features, qualification and quality; the whole society shall improve their identification, recognition and perception for vocational college students; related policies have only defined vocational colleges with the same importance as secondary vocational school, which restrict development of talents. At last, greater efforts should be made to deepen and enrich the cultural connotations of higher vocational education (Xiaoli Zhang; Yuejun Long et al. 2010). Therefore, how to make higher vocational education more attractive becomes a realistic and urgent task.

Great Changes have Taken Place in the Structure of Student Basis for Higher Vocational Education

Vocational colleges are suffering from a sharp reduction in traditional student basis. In this year, there was a year-on-year decrease of 20% in the number of applicants in Beijing and Hunan, and it is estimated that in 2018, the number of students applying for vocational colleges in Hebei will drop by 50% compared with that in 2009. There have been insufficient application numbers in Shanghai in the past three years in a row. Apart from this, the number of young people aged from 18 to 22 is expected to decrease by 40 million in the next decade. What's more, the reduction in student numbers will intensify the competition and elimination of vocational colleges, which will in turn get those with no characteristics or with poor management into difficulties. According to the statistics by the Ministry of Education, the number of secondary vocational graduates recruited by vocational colleges under the policy of counterpart cooperation accounts for 13% in the total enrollment; besides, 5% of the students are enrolled in five-year vocational colleges, which means that altogether 18% of students enrolled in vocational colleges in China are from secondary vocational schools. The enrollment in higher vocational education is 3,13 million, and it is estimated to increase to 3,2 million. If 20% of the 8 million students from secondary vocational schools are enrolled in vocational colleges, there will be a foundational change in the student source structure, for nearly half of the students in vocational colleges are graduates of secondary vocational schools. Accordingly, proper adjustments should be implemented in talent training program, teaching model and management.

The Condition of the Teaching Cohort in Higher Vocational Education Should be of Concern

The Teaching cohort plays a dominant role in the talent training of higher vocational education. Nevertheless, the structure of the teaching cohort in China at present is not satisfactory. Only a small part of all full-time teachers are with senior titles, and academic leaders are in shortage. Taking Zhejiang Province as an example, over 95% of professors in vocational colleges are retired from research institutions and regular institutions of higher learning, all aged over 60 (Research on the pattern of the teaching cohort in higher vocational and technical education). What's more, there is a severe shortage of teachers with high educational background, with teachers of master degree less than 4% of the total number. Besides, two phenomena occur in vocational colleges. First of all, an over-large percentage of young teachers are working in vocational colleges; in some colleges the rate reaches as high as 60%. And second, the proportion of retired professors employed in the teaching cohort is too high, reaching 45% in some vocational colleges. Vocational colleges are in bad need of double-quality teachers, especially teachers with high technical quality, who account for less than 15% of the current teaching cohort. The situation of the current teaching cohort will no doubt prevent the development of vocational colleges with their own characteristics, and affect the function to produce qualified application-oriented talents.

Practical Training in Higher Vocational Education is Still a Weak Aspect

To some extent, the quality of talent training in vocational education lies in practical training, which is somehow still backward in China. In April, 2004 it was pointed out in "opinions of the Ministry of Education and Ministry of Finance on strengthening the development of vocational education", that "many constraints, such as poor conditions in practical training base, lack of equipments, and relatively low quality of teaching cohort have affected the development of practical skills of students in vocational school and colleges", and it has been decided in the document that "the State should promote the construction of practical training bases of vocational education in various areas guided by central government funds, with the view to deepening the reform of vocational education." Thereafter, the State made large financial investments to promote the construction of practical training bases. However, the over-diversified investment, namely allocating the limited fund to too many schools, led to some problems. Large-scale practical training bases can not been constructed due to lack of funds; vocational school and colleges, suffering from financial difficulties, and no corresponding favorable policies designed by government are not able to construct their own bases; finally, enterprises have no interest in receiving students for internships. Because of underdeveloped trade associations nationwide and lack of consistent basic professional qualifications, vocational schools and college have to train their students based on their teaching experience. As a result, school, enterprise and the society are seriously disjointed. Furthermore, the shortage in teaching material for practical training makes it impossible for new knowledge, new technologies and new cases to be compiled timely, which greatly affects the quality of teaching, and against the requirement of teaching goal, educational reform and the development of the time (Popular Science and Technology 6 (2006), p.144-145).

Approaches and Policies on Promoting the Reform and Development of Higher Vocational Education in China

Further Increasing the Attraction of Higher Vocational Education to the Society

As mentioned before, the project on construction of national exemplary vocational colleges has produced significant social effects. In order to improve the attraction of vocational education to the whole society, we must continue to consolidate the implementation of the project in the next three years, keeping the sound momentum of higher vocational education. The focus of this effort will be on the proper expansion of national key colleges of vocational education and the construction of open and shared teaching resource bank. In this way, the availability of higher vocational education resources will be improved for the whole society, and the scope of beneficiaries will be enlarged (Jiansong Zhou, 2009). Secondly, we should enhance the publicity on the significant role and function of higher vocational education, especially the achievement of construction of exemplary vocational colleges with the aim of winning more attention and recognition in the society, and carrying forward the belief that "every profession produces its own best". Therefore, a fine environment of respecting,

valuing and supporting vocational education can be cultivated in the whole society. Furthermore, an connection to higher vocational education that is beneficial for the further study and training of graduates from vocational colleges shall be established. Further efforts should be directed to promoting the social status and income of skilled talents in the frontline of manufacturing and service industries. Special policies of reward and incentive for excellent skilled talents should be instituted, and skilled talents who have made exceptional contributions should be amply rewarded and awarded honorary titles.

Further Adjustment Should Be Made to the Enrollment Policy of Higher Vocational Education

Because of the great changes in the structure of the student basis in higher vocational education, the current enrollment policies should be properly adjusted. First of all, vocational colleges need to take qualified graduates from secondary vocational schools as their main target of enrollment, instead of students from regular senior high schools. Second, we should revise the current recruitment policies in regular institutions of higher education. It is advisable to allocate a proportion of enrollments in disciplines of applied technology in regular institutions of higher learning for graduates from secondary vocational schools. Graduates from secondary vocational schools should be allowed to apply for regular institutions of higher learning; what's more, we must increase efforts to ensure that a part of the excellent students from vocational schools can be accepted in such regular institutions. However, this policy can only be implement effectively on condition that secondary vocational school students must strengthen their basic professional knowledge and pass a special test. In accordance with this policy, reform needs to be carried out in the current enrollment standard and mode; in addition, the large scale of recruitments of students from secondary vocational schools may result in the tendency of examination-oriented education in these schools, which needs to be prevented. And efforts have to be increased to change the current recruitment mode in some vocational colleges from guerrilla-style to organized and regional-style. Only by these adjustment measures, we can achieve the goal of training qualified technology-applied talents with sound theoretical and practical knowledge, fully demonstrating the significance of higher vocational education. In addition to these efforts, an educational link can be constructed to ensure a better connection of secondary vocational schools with institutions of higher educations, and the sound communication between regular vocational schools. The channel for graduates from secondary vocational schools taken by colleges of various categories will therefore be widened, with the view of attracting and guiding more junior high school graduates to receive secondary vocational education. This policy will pave the way for them to enjoy education of higher level and make greater achievement; meanwhile, it can also lay a sound foundation for regular vocational schools, so that they are able to give full play to their advantages and bring up a large number of inter-disciplinary talents.

Speeding up the Progress of Training Double-Technique Teachers

Catering to the need of higher vocational education and teaching, we must increase

efforts to build the teaching cohort with double technique. In order to speed up the progress of training program, the State should encourage professional teachers to engage in scientific researches, especially research on key projects of the related enterprise. The cooperation between schools and enterprises needs to be enhanced with the view to cultivating vocational skill and teaching capability of professional teachers in the process of transferring scientific research into products, and achieving the goal of becoming double-quality teachers. Next, vocational colleges can assign professional teachers to work in the frontline of related enterprises for the end of supporting technological progress and product development. In this way, practical skill of professional teacher will be promoted. With the technological progress of enterprises and the generation of teachers with double quality, a win-win result can be achieved. Thirdly, encourage teachers to establish companies and factories operated by schools, which can accelerate the transference of achievements in scientific researches to products. The economic benefits thus produced can in turn provide funds to vocational colleges, such as providing sites for practical training, promoting the integration of production, study and research. What's more, the school-run industry can attract professional teachers to take temporary post there, which will strengthen their teaching ability of practical training, and speed up their change to double-technique teachers (Shouxing Zhang, 2009).

Increase Efforts to Build a New System of Practical Training Bases in Higher Vocational Education

Strengthening the construction of practical training in higher vocational education is the key to ensure the quality of talent cultivation. Thereafter, first of all, the State should consolidate institutional improvement. A management system for the school-running of vocational colleges needs to be built for the sake of speeding up enterprises' participation. We also need to improve the policy climate for enterprises' participation in higher vocational education, with the view to ensure that they enjoy institutional protection in provision of equipments, training bases and part-time teachers, and in their engagement in discipline and curriculum development, reception of interns and training of teachers from vocational colleges. In this way, the management system for the cooperation between schools and enterprises can be effectively implemented. Secondly, bring the role of governments and trade organizations in standardizing the vocational qualification, vocational credential and employment permit system into full play. We should accelerate the establishment and improvement of work-study program while optimizing the policy climate for the enterprises' participation in higher vocational education and for vocational colleges' participation in enterprises' talent training. Thirdly, speed up the development of grouping of higher vocational education. The focus of this effort will be on encouraging the construction of vocational education groups jointly held by schools and enterprises with the local exemplary vocational colleges as their model while promoting the experience of building such projects nationwide. This measure is designed to integrate the talent training in vocational institutions with enterprises on the strength of regional or professional connection, providing a institutional platform for their cooperation. Enhance the dominant position of groups as the production-study center with the focus on integration of production and education resources and

communication between enterprises and schools. Measures like production-study cooperation and educational training are encouraged to go into operation. This is an attempt to explore a new mechanism of driving the reform of higher vocational education by exemplary vocational colleges to the end that higher vocational education with Chinese characteristics will make a breakthrough in the whole undertaking. At last, acceleration of the legislation program of higher vocational education is to ensure its features and quality as a new type of higher education. The State needs to set up clear policies and regulations regarding cooperative running-school between vocational colleges and enterprises, management models, education and teaching, building of a double-technique teaching cohort and resource allocation in order to lay a solid foundation for legislation work. In this way, the specialty structure and development layout will be optimized, promoting higher vocational education to meet the practical demand of regional economic and social development and produce all types of highly capable personnel.

References

- Wu Yan (2010): the number of students of higher vocational education has grown by 11 times. <http://edu.people.com.cn/GB/79457/11171517.html> [Accessed: 18/3/2010]
- Notice of the Ministry of Education on the result of major setting of higher vocational and technical schools in 2009. <http://www.tech.net.cn/page/N005/2009022500020.html> [Accessed: 25/2/2010]
- Xie Yang (2009): Four Doubles have been achieved in the construction of national exemplary vocational colleges in three years. China Youth Daily. [Accessed: 30/11/2009]
- Xie Yang (2009): the employment rate in national exemplary vocational colleges is over 96% this year. China Youth Daily.http://www.tech.net.cn/page/N002/2009112900001.html [Accessed: 29/11/2009]
- Xiaoli Zhang; Yuejun Long et al. (2010): System Analysis on Attractiveness of vocational education. China Higher Education Research. [Accessed: 06/2010]
- Research on the pattern of teaching cohort in higher vocational and technical education .<http://www.tech.net.cn>
- Current situation and reform strategy for practical teaching in higher vocational and technical colleges. In: Popular Science and Technology 6 (2006), p..144-145
- Jiansong Zhou (2009): National Exemplary Construction and the Promotion of the Attraction of Higher Vocational Education, <http://www.cvae.com.cn/www/gz/09-11-25/4626.html> [Accessed: 25/11/2009]
- Shouxing Zhang (2009): Double-quality Teaching Cohort Building and Major Group Construction in Higher Vocational Colleges. In: Higher Vocational Education-Journal of Tianjin Vocational University 18 (2009) 3

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New modes and New problems of school-enterprise cooperation in China's vocational education system

"Combining education with productive labor" has always been advocated as an important concept in China's education circle since 1949. Through "cooperation between schools and enterprises" (or "combining learning with working" from the view of teaching practice), to cultivate skilled talents is a concrete reflection in the field of vocational education. In the planned economy period, a part of the national income used to flow into the subordinate vocational education institutions through the channels of publicly owned enterprises, forming a tradition that both the departments of the trades and enterprises should run the school. However, with the large-scale reorganization of resources, reducing burden and increasing efficiency inside the companies since the 1990s, the old ways are hard to continue. From then on, some new organizing forms and running mechanisms of school-enterprise cooperation have emerged; making China's vocational education undergo profound changes.

The end of traditional school-enterprise cooperation mode

In the early 1950s, based on the experience of Soviet Union, China built or rebuilt the former vocational schools into the "secondary specialized schools" and "technical schools". As the main form of vocational education, the former were run by the relevant departments of the trades, aiming to cultivate middle-level specialized cadres; while the latter were run by the labor departments, aiming to cultivate middle-level technical workers, among which, enterprise-run schools account for a significant proportion. In the planned economy era, although these two types or schools met some difficulties during their development, they could still coordinate between the classroom and the production workshop in the established school-running system, so that students could get the necessary work on-site training opportunities. Until the 1980s, vocational schools and enterprises attached to the relevant departments established long-term cooperative practice bases, factories run schools, plus schools run their own practical training workshop, practice farms, teaching hospital, etc., all of these can be regarded as the common practice of school-enterprise cooperation. However, a new type of school, that is "vocational high school," also emerged rapidly in order to ease employment pressure and entering higher school pressure since 1980s. Most of them were changed from the regular schools. On one hand, they lacked practice bases and other requirements such as equipment used in practice and qualified teachers. On the other hand, they also couldn't enjoy the convenience of the above-mentioned cooperative system. In order to avoid

the disjoint between production and study and even falling behind the times, these schools have to feel for a way themselves so as to establish contact with enterprises. This represents an obvious difference within and outside the system.

In the next several years, China's school-enterprise cooperation in vocational education system developed along these two inside and outside system channels respectively. On the one hand, the traditional mode is still advocated. Many departments of the trades and even local administrative leaders have done many attempts for the unified management of schools and cooperative enterprises (like what some cities did when they learnt from Germany's "dual system" experience during 1989--1995). At the same time, in order to change the simple consumption situation to the enterprises or the practice workshop for arranging students' internships, the government also established a "practical teaching and production (business) integration" policy, which tries to not only cultivate talents, but also produce the outputs, not only guarantee the quality of training, but also improve economic efficiency. But to the real implementation, it seems that it still cannot alleviate the cost burden brought by this school-enterprise cooperation mode.

On the other hand, those vocational high schools that have a weak basis usually tend to adopt a "joint school" form. Usually after signing the contracts with enterprises, the schools will provide directional training according to enterprises' employment requirements. tThe enterprises will give some support in the quality of teachers, practice base, school funding and graduate employment. Some enterprises will even return some training costs to schools according to their recruitment of graduates. Such a mutually beneficial cooperation increasingly reveals its vitality in China's economic transition, that is, from the planned economy to the market economy. It also gets the attention and support from education department. In the 1990s, not only vocational high schools, but also secondary specialized schools and technical schools also attempted the "joint school running" mode in different degrees. By 1996, the proportion of running joint schools among various types of vocational schools and enterprises had reached 80%.

By the end of 20th century, different manifestations of these two school-enterprise cooperation determined the development trend of China's vocational education in the new century. From 1998 to 1999, China's State Council and relevant departments developed a series of policies and specific implementation views (of which the most important one was the "Decision on further adjustment of management system and branch structure of State Council departments' (organizations) subordinated schools" issued in December 1999, which proposed that the administrative functions of the secondary specialized schools and technical schools should be transferred to the local governments. Thus, at least at the management system level, boundaries among the three types of vocational schools had become blurred. Just like the vocational high schools which used to be outside of the system, they all have to face the market and seek an effective method to mobilize educational resources within the enterprises. They can no longer rely on executive orders from the relevant department to achieve school-enterprise cooperation. How to strengthen the links between schools and enterprises has become a priority for the running of vocational education schools.

Several typical new modes of school-enterprise cooperation

"Order-based training": cooperation between market actors

In fact, the past practices of many vocational high schools have provided a new direction to the school-enterprise cooperation under the new environment. That is, "to seek support through service", which means by jointly running school with enterprises, schools will help them cultivate the needed specialized talents. After the year 2000, this pattern was vividly named as "Order-based training" by some vocational educators. "Order" used to be a business jargon, referring to the contracts, leases or documents signed when buyers order goods from sellers. Extended to the education field, the operation process of "order cultivation" is as follows: first, according to the employment agreement signed with enterprises before, schools will select candidates in proportion to the number of graduating students; then provide the training courses according to business requirements; and provide to the enterprises for evaluation and employment on time. This is a training mode which combines academic education and pre-job training. "Tailor made" is its most distinctive feature and can also be said as the biggest "selling point" for the enterprise.

Now it is very difficult to find out which is exactly the first vocational school to raise the flag of "Order-based training". Even from the sense of theoretical research, this "tracing to sources" still has its values. After all, making the educational cause whose aim is to achieve all-round individual development equivalent to business on-demand production in any case will result in a strong ideological impact in China's education field. But there is no doubt that since the new century, the successful "Order-based training" cases have been known by more and more people. Through the order form of training, batches of skilled personnel have entered into various industries of national economy. In 2002, expressions like "Order-based training" were finally recognized in the documents published by the government. Nowadays it is still regarded as a distinctive feature of vocational school running in the publicity.

In many cases, the smooth development of order training depends on the basis of the cooperative enterprise's own training system. The cooperation between a vocational school in Shaanxi Province and Toyota is a successful case in this area. In 2004, both sides signed the letter of intention for cooperation in China. The vocational school brought in the Toyota -Technical Education Program (T-TEP). From then on, the school provided Toyota with a number of excellent vehicle repair technicians who got proficient and standard skills and could quickly adapt to the new post in the form of orders. During the cooperation, Toyota provided advanced training methods, new automobile technologies and advanced training equipment to the school for free, helped the school set up automobile maintenance and repair teaching system which synchronized with the modern automobile industry development. The professional teachers also received a regular Toyota technical training course. While the school would recruit outstanding students to join the "Toyota class" and sign the employment agreements with dozens of Toyota 4S shops nationwide, some 4S shops also became the outside base for teaching practice. Students of the "Toyota class" have to attend both theoretical and practical skills assessment organized by Toyota before

their graduation. They should at least get a "Toyota A certification" in order to get the diploma and qualification to be employed by Toyota 4S shops. Every year before the graduation, the school will hold a "Toyota Recruitment Day", in which Toyota franchise 4S shops all over the country were invited to recruit graduates. This also gives students a platform to present themselves and eventually find a satisfactory job.

But realistically speaking, most of the order trainings are not so perfect. Usually in practice, if vocational schools and enterprises which belong to different management systems want to reach the cooperation agreements, they still have to overcome many communication difficulties. For example, from the consideration of enrollment, schools wish that each order can guarantee a certain class size (usually the training number of a single order has to be no less than 20 so that the organization can be effectively implemented), preferably also with a more long-term continuity. But the reality may be many enterprises don't need so many graduates for one order and there is no continuity most of the time. In addition, enterprise's demand for qualified personnel is not always displayed to public exhaustively. A single vocational school can not always find the most suitable partner without any effort. That is why education administrative departments often called for schools to "increase market awareness", "strengthen market research," actively try every method to "find business" and "win orders".

Facing with the above situation, the deficiency of order training which is in full compliance with the market trading patterns has already shown: on one hand, they are full of uncertainties in the training market, on the other hand, the continuous communication and mutual adaptation between school and enterprise will also bring a lot of trouble to both sides. So can we find a method which can keep a long-term and steady cooperation between vocational school and enterprise? The vocational education's exploration in recent years gives a positive, but not the only answer.

Relying on business industry to develop education: a top-down transition

To achieve new development in the succession is obviously a feasible way out. Thus we can see that in some areas which have a good tradition to rely on business industry to develop education, such as Tianjin in North China, though since 1999 many departments of the trades have transformed to the general company of a group with an enterprise nature, their close relationship with vocational education largely continues down. Today, more than 70% vocational schools are still run by relying on industry (Enterprise Group). The operation of school-enterprise cooperation still keeps a high level structure which can fully dominate school and subordinate enterprises. The usually called "industry" has already changed into a market entity, with the original administrative part removed.

According to statistics, from 2001 to 2005, the total input of Tianjin vocational education funds was 4,8 billion RMB, of which 2,8 billion was fiscal funds; business industry investment also reached 2 billion RMB. Business industry has not only provided strong financial support for vocational schools, but also was directly involved in school development. Some transformed enterprise group also sent corporate executives to be the heads of vocational schools, or put some subsidiary companies under the vocational school to further integrate the management of schools and

enterprises. In recent years, most of the vocational schools set up a "major setting steering committee", which consists of senior managing executives, frontline technicians and the relevant technical experts, curriculum experts, school teachers and many other professional staff. The committee's function is to participate in the setting of majors as well as the design and implementation of the training programs. On the one hand, according to the requirement of enterprises for qualified personnel and the need of social economy development, it will help schools to set up employment-oriented majors; on the other hand, it will also determine teaching objectives of each major as well as the criteria of vocational ability; then based on these, it will further formulate a programmatic teaching plan, which will provide the basis for the specific teaching objectives, curriculum design and teaching content. With all the effort, it attempts to transfer the industrial advantage into the major advantage, which will be further transferred into the teaching advantage through the implementation of teaching process.

In this case, it becomes a normal condition that vocational schools and enterprises which belong to a certain industry will work together to start the order training. Compared with the random cooperation through the separate consultation by schools and enterprises, such an order training mode is obviously more targeted and effective. The enrolled students are actually the recruited employees. They can not only accept the general cultural knowledge, special theories and techniques for the vocation as well as some preliminary simulation training at vocational schools, but also stay in the real business environment to complete some productive operation and finally form the technical practice ability. During the implementation of teaching programs, the specially-assigned people from both school and enterprise side will be responsible for teaching supervision, timely feedback and problem solving: the school must be in strict accordance with the contents and programs of the teaching plans, there must be a special staff responsible for site management, guidance and services; while enterprises should send special personnel to make arrangements for the students' practice stage and provide students with the necessary learning and living guarantee. Through the method in which study and work can interchangeably integrate, the theory study in classroom and the practical work in the company can be closely combined together (the proportion of time between the two is often 1:1 to 1:1.5), students can both have an educational qualification and a vocational qualification certificate when they graduate.

Here we can use a specific case to show this new mode of school-enterprise cooperation. This case is about Tianjin No.1 business school, a vocational school financed by Tianjin Yishang Group, a business group transformed from departments of the trades. Tianjin Yishang Business Group ranked as the top 500 Chinese enterprises, top 10 in the national service industry and retailing industry. With a solid wealth condition, Yishang Group has invested tens of millions of RMB to make the school obtain a virtuous cycle development capacity. Its hardware and software facilities also improved a lot year by year. In order to give full play to its comprehensive strength in personnel, funds, facilities and equipment, Yishang Group set up a "united school-enterprise committee". Compared with the usual "major setting steering committee", this is a higher-level institution, which deals with some practical things such as contacting the school and enterprise and coordinating the cooperation in personnel

training. At present, the contacting scope of the committee has gradually broken the original subordinate relations and the committee begins to draw some other large and medium enterprises as its members, which opens a new professional training base and employment channel for students. In the practice of school-enterprise cooperation, the cooperative enterprise has established 8 students training bases for Tianjin No. 1 business school, including the retail, supermarket, wholesale trade and other major modern service industry. They will arrange students for a one-year internship and give each student 500-600 RMB per month as internship fee, which can to some extent alleviate the economic pressure of poor students. In recent years, graduates from this school always take up 50% -60% among staff in the technical services and business and management positions. The feedback they get from the enterprises is always: can master the basic knowledge and skills in trade service industry; understand the basic operating rules of the market economy; have the hard-working spirit and business integrity, can get familiar with the situation quickly, and be easily used and retained, and bring value to the company. Because of this, as the first choice for graduates, the Group owned enterprises generally will put forth requirements in advance to school. Then the school will look for students based on the needs of enterprises. So once the students get out of school they can enter into the enterprise immediately and finally achieve "zero post taking".

In short, the development of vocational education in Tianjin shows that during the process that departments of the trades quit the government system, the new top-down mode of school-enterprise cooperation can be formed by repositioning relationship between vocational schools and the transformed enterprise group. This mode, usually called the "Tianjin model", features relying on business industry to develop education. It also opens the new ideas and new ways of letting the industry form vocational education groups, promoting the integration of superior resources and developing the vocational education.

Relying on majors to commence business: a bottom-up exploration

Compared with the success of "Tianjin model", in those areas with a lack of industrial-school experience such as some small and medium sized cities and vast rural areas, it will be more difficult and risky to only rely on vocational schools' spontaneous exploration to search the sustainable school-enterprise cooperation. Just in the case of students' practical training, there must be a stable practical training base in the school-enterprise cooperation, which can ensure that students will not just go to the company to fill in some temporary and random post. Therefore, traditionally there are two kinds of choices for schools. One option is to build a training base funded and managed by the two sides. This type of training base has obvious enterprise characteristics. Students can learn in a simulated environment under the guidance of production workers. Schools can also reduce capital investment and save costs. But because the base is built together by both sides, the company has to arrange the equivalent task to cover the production losses during the students' production practice. If things continue this way, students' practice content, their arrangement of time will be limited to the production task of the enterprise. Another option is that the practice workshop will be built by the school itself. Although the school will take the initiative to organize and guide the

training, it often resulted in the separation between practice and production. Besides, the management costs and consumptive material expenses are both very high during the running of training base. Only input without any output makes it very hard to just rely on the limited education funding to support the operation, equipment upgrading and expansion.

However this problem is solved in Xiangshan county, Zhejiang province in China. Under the support of the local government, the county has been vigorously pushing the industrialization construction of the training base since the late 1990s. The vocational school, that is, the Xiangshan County Vocational High School, not only has its own training base, but also has real business enterprises. Each enterprise has an independent financial system without any economic indicator pressure. The enterprise profit will be turned over to school to improve "hematopoiesis" of major, thereby speeding up the modernization of the major itself. This is called the "Xiangshan model" by experts.

About the successful experience of the "Xiangshan model", the one most often talked about is the "Xiangshan Citrus Research Institute" set up in May 1997. Xiangshan County is in subtropical hilly areas. The soil and climate there are suitable for citrus planting. Therefore citrus planting is the pillar industry of the county's agricultural economy, with up to 16474 acres citrus planting area. However, due to the lack of technology, citrus planting in the past had series of problems such as the ageing of trees, single variety and extensive management. Because of the overstock of citrus, many farmers even began to grow other crops. Under such a circumstance, Xiangshan Citrus Research Institute was set up with the support of teacher strength in the agricultural education area of Xiangshan County Vocational High School. After its founding, the institute has introduced more than 40 varieties of citrus (excellent individuals) from Japan, the United States, the Netherlands, Spain, Israel and other countries, which greatly improved the quality and output of citrus and solved many technical planting problems. Then the institute cooperated with the local government to build a demonstration base of citrus in the form of contracting. While demonstrating and popularizing the new varieties and technologies, the institute can also realize a "win-win" situation with the villagers in achieving the economic benefits. Further, the citrus demonstration base could also be the training base for the agriculture major students in the school. By participating in the cultivation of new varieties and the test for new technology, the students can fully understand the technology and experience of citrus planting and be trained to become local model households and leaders of citrus planting. As a result, the school's concept "design majors according to the market, start the business based on majors, improve majors by developing business , attract more business by strengthening majors" was also taken into effect.

In short, the realization of the "Xiangshan model" is based on the "industrialization construction of the training base", which means the school will rely on itself and take advantage of its teaching staff and equipment resources to build a training base with an enterprise operation mode. Internally, it is a practice training base; externally, it is an enterprise providing paid service to the society. Therefore, it has a dual function as a training base and enterprise. Since 1997, Xiangshan County Vocational High School has established "Xiangshan Citrus Research Institute", "Xiangshan Zhigao

Project Management Co., Ltd", "Xiangshan Zhigao Building Materials Testing Center", "Xiangshan Zhigao Advertising Company", "Xiangshan Zhigao Education Training School", "Xiangshan Hailanlan Travel Agency Co., Ltd", "Xiangshan Port City Hotel" and other training bases with enterprise operation modes. The principal is the legal person of each enterprise. Each company will also set up a board of directors composed of heads of school and enterprise. In this board, the principal doubles as the chairman, professional key teachers will be the general managers, while the company's employees come from professional teachers and staff recruited from the society. Currently, after paying the state taxes, these companies will turn over more than 1 million RMB to the school annually. Some new bases which combine education, production, scientific research, management and service are still under construction.

10 years of practice has proved the feasibility of developing the enterprise-school cooperation though the industrialization construction of training base. On one hand, it ensures the synchronization between the teaching content and the local economic development; on the other hand, it also makes the key major construction in Xiangshan County Vocational High School in a benign development. As school leaders themselves concluded, the advantages of industrialization construction of training base are as follows: Firstly, it fully meets the needs of student's skills training and greatly increases the training effect. It also solves the work-study problems of those poor students. Secondly, after finishing the teaching task, professional teachers can take part in the managing and operating process in the relevant enterprise. Through practice, they can better grasp theories, improve their academic levels, get cutting-edge business information, and enrich the teaching content; thirdly, it maximizes the utilization of equipment and facilities. According to market demand, training equipment and professional resources can be open to society to make some economic benefits. The profit will be turned to the training base to improve "hematopoiesis" of major, thereby reducing the education cost.

But some observers also believe that the success of the "Xiangshan model" is not the real victory for vocational education. It is just a consensus reached by both government and school. Every year many vocational school principals and the delegations will come to Xiangshan County Vocational High School for visiting and learning, while very few can really implement its experience. Because in China's existing policy framework, some practices during the industrialization construction of training base can not be popularized universally. Officials of Xiangshan County also admitted that "for now, still a lot of difficulties for school to start business exist". During the preparation for building the training base, the local government made a lot of effort to coordinate the state asset management department and business management department and offered many preferential policies. Then the companies were finally set up. So some experts commented that government can bring out the crucial point during the development of vocational education. From the present training structure and mode of vocational education, a tacit understanding between school and government should be promoted. However, we still can not help but have such a doubt, that in other areas, vocational school's "bottom-up" exploration can only be realized through government's special support?

New problems and the solutions

In fact, the reason that both the "Xiangshan model" and the "Tianjin model" are named after an area is that such an ideal environment is too special and such successful experience is too rare. For most of the cases, the cooperation between enterprises and vocational schools often lacks an overall plan, while the school itself doesn't have its own enterprise or training base to manage and dominate. And more generally, in China there are too many companies which have the training qualifications and skilled personnel demand but keep themselves out of the cooperation. Many necessary enterprise education resources haven't been fully mobilized during the school-enterprise cooperation. This is a reality that any people concerned about China's vocational education cannot avoid. For the near future, what is the way out for school-enterprise cooperation? How to promote the explored new model? And how to adapt it to the constantly improving market economy? Various questions all come down to one point, that is the school-enterprise cooperation must be supported by favorable external environment.

In the current research field of China's vocational education, what measures should be adapted to effectively improve the school-enterprise cooperation is also the focus of many researchers. A variety of advices on the current school policy are emerging prominently. The focus of the advices is first to attract the powerful companies, including those enterprise groups transferred from the departments of the trades, to participate in the vocational education. This is not a new proposal, but in the past, advisors were limited to the traditional in-system coordination, only concerned about "what kind of guarantee the enterprise can provide to the vocational education development". The advice under such a circumstance is more or less a wishful thinking, and even inappropriate with the change of the management system in vocational school. Only in recent years, when the researchers deeply felt that enterprises and schools have different interests to pursue, that is, the first goal of school is to educate people and to pursue the social benefits; while the first goal of enterprise is to seek economic profits, then advices in this aspect began to be pointed.

For example, recently some researchers believe that the key to promoting school-enterprise cooperation is to have a whole market vision, to analyze from the new perspective of developing corporate resources. The study pointed out that enterprises´ strong demand for highly skilled personnel, the good employment practices and institutions of governance, as well as other factors like the low flows in the apprentice labor market, all of these will lead to the results that "enterprises are keen to vocational education" (this cause-effect relationship can be fully proved in German "dual system" vocational education). Therefore, we should encourage all levels of government to play their restraining and stimulating role and rely on market mechanisms to establish an "enterprise-based educational resources" development system that conforms to China's national conditions. The specific measures are as follows: to establish an income security system so the enterprise can exclusively enjoy the income from the training investment; to calculate the talent cultivation cost and allocate it reasonably between enterprise and public finance; to set up a learner's career development channel and to improve the status of vocational education and so on.

Of course, on the other hand, the improvement of the external environment should also include the possibility to set up profit businesses for vocational schools. Especially for those early pioneers, they might encounter some conceptual obstacles. Education was traditionally regarded to be separated from "the cause of making money". School or even a part of it cannot take profit making as its goal. (In the planned economy era, even businesses were non-profit, as long as you can complete the production tasks). However, under current conditions, if a school just relies on the government's financial support but not its own effort, it still can't solve the "money" problem or satisfy the school's ambition to arrange for students' training program autonomously. So, when the subjective thinking and the objective reality come into conflict, policy adjustments can only be based on reality but not the contrary.

From a more general and macro perspective, maybe the basic strategy is to adjust the corresponding legislation to create a favorable institutional environment for school-enterprise cooperation. Recently some vocational education experts read the relevant laws during the implementation of German "dual system". Among which, they particularly interpreted the "vocational education contracts" which standardized the rights and obligations of the educator and educated. They were inspired greatly and therefore made the following suggestions: Firstly, to amend "Vocational Education Law of the People's Republic of China" (enacted in 1996) as soon as possible to make the legal status of school-enterprise cooperation clearer. Because the current laws prescribe that only schools and training institutions have the qualifications to start the vocational education, enterprises don't possess such qualifications, while the state should carry out tax regulations which are beneficial to the school-enterprise cooperation. For those enterprises which pay interns salary, they should be given some appropriate tax incentives. And at the operational level, teaching program and personnel training agreement (contract) in accord with the personnel training policy of the school-enterprise cooperation should be uniformly studied and discussed by the government to make them legalized and standardized. Studies suggest that, with the "nurture of those systems and laws above", the sound and continuous development of school-enterprise cooperation in China will have a solid guarantee.

How effective the proposed reform measures are still lack the test by the actual personnel training. In any case, it is a right direction to solve the problems by working on regulations and system construction. Examining the development experience of other countries will also give us a lot of useful lessons. With the further cooperation between enterprises and vocational education, new problems and new barriers of the system, mechanism and even concept will come out. All of these problems will make the vocational education experts think at a more profound level, which is going to bring about a series of more innovative practices. In one word, only in the constant development can the problems that arise from the development course be resolved.

References:

- Jintu Yang etc (2002): China's education reform tide in the 1990s: On vocational education.In: Beijing: Beijing normal university press.
- Feizhou Liu (2006): T-TEP project the successful paradigm of the training mode of the cooperation between schools and enterprises. In: Chinese Vocational and Technical Education 19 (2006)
- Deyi Long (2006): To develop in the succession and to innovate in the practice: the research and exploration on the mode of the work-study programme of VTE in Tianjin. In: Chinese Vocational and Technical Education 32(2006)
- Yan Yang (2008): Exploration on work integrated learning in vocational vducation reform in Tianjin. In: Educational Research 11(2008)
- Wei Guo (2007): Adhere to the road running industry, Cultivate the high-quality talents. In: Beijing: Higher education press.
- Linde Chen; Lie Chen (2009): Industrialization, integration and management: Zhejiang Xiangshan higher vocational school practice base construction and management of the basic mode of operation. In: Vocational & Technical Education Forum 20 (2009)
- Shiwei Li (2008): Direct mode: innovation to win. In: Education and Vocation 2 (2008)
- Yanhui Chai (2008): A study on the transferability of dual system: from the perspective of developing educational resource. In: Education Science 5(2008)
- Gengfu Zhou; Dongxue Li (2006): The combination between practice and instruction expects the nurture of law and regulation: the revelation from the VET contract in Germany. In: Chinese Vocational and Technical Education 31 (2006)

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