

Journal of Asian Vocational Education and Training

Volume 3, Number 1 December 2010

- | | | |
|---|----|--|
| <i>Seung-Il Na</i> | 1 | Recent Trends and Future Direction of Vocational Education and Training in Asian Countries |
| <i>Kuei-Chih Chuang
Mei-Chuan Tsai</i> | 27 | The Exploration and Inspiration on the Comparison of Technological and Vocational Education between both in Taiwan and Japan |
| <i>Kul Basnet
Sang-Ho Woo
Jin-Soo Kim</i> | 43 | Accreditation of Technical Education and Vocational Training in Nepal and South Asian Countries |
| <i>Lin Yang
Zhiqun Zhao</i> | 59 | Empirical Research on the Vocational Ethics Development of Vocational Institution Students in China |
| <i>Nyan-Myau Lyau
Ling-Hui Liu</i> | 75 | An Inconvenient Truth in Taiwan: A Comparison of Income Level between General High School and Vocational High School Graduates without Further Schooling |

<i>Moriki Terada</i>	83	Challenges of Vocational Education in Japan: From the View Point of International Comparison, Especially in Asian Area
<i>Xu Han</i>	95	A Survey and Analysis of the Status of Enterprises' Participation in Vocational Schools' Practical Teaching
<i>Dong-Yul Jung</i> <i>Seung-Il Na</i> <i>Doo-Jin Jung</i> <i>Hye-Kyung Lim</i>	107	The Relationships among Innovative Culture, Organizational Learning, Commitment to Change and Support Behavior for Change in Meister School
<i>Yasuyuki Takahashi</i>	117	Present Status of and Strategy for the Development of Human Resources among the Youth of Miyagi Prefecture: Focusing on Public Vocational Training
<i>Won-Sik Choi</i> <i>Zi-Long Yin</i>	129	A Case Study on Learning Behavioral Styles for the Workers in a Multinational Tire Company in E-Learning Environment
<i>Zi-Long Yin</i> <i>Seung-Kwon Nam</i> <i>Won-Sik Choi</i>	139	A Conceptual Study about Order-Oriented Training Mode in Technical Vocational Education and Training
<i>Bing-Yuh Lu</i> <i>Tien-Der Han</i>	149	Perspectives in the Policy of Language Education: Statistics of the Web Searching Engines



Recent Trends and Future Directions of Vocational Education and Training in Asian Countries

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ABSTRACT The purpose of this study was to describe the recent trends and future directions of vocational education and training in Asian countries. Vocational education and training in Asian countries seems to have been governed as a centralized system under the government while a higher level of national development has a strong vocational education and training system. Vocational education is generally governed by the education ministries while labor ministries are responsible for vocational training. The developing countries have the largest number of teachers and students participating in vocational education and training programs, followed by the developed and underdeveloped countries. Industry-school cooperation is becoming more important in common. The connection between vocational training and vocational education needs to become stronger as a nation is more developed. In addition, some directions were suggested for the improvement of vocational education and training in Asian countries.

KEY WORDS trends, vocational education, vocational training, Asian countries

Introduction

Asia is the most densely populated region where two-thirds of its people are under the poverty level, but throughout 1980s and 1990s, there has been rapid economical growth, about 7-8% of annual growth, which led the region to become a representative market (Park, Lee, Lee, Shin, Kweon & Choi, 2009). Also, in spite of the recent global economical crisis, the countries such as China and India have maintained steady GDP growth rates at about 6% (Choi, Jung, Kim & Jang, 2007).

However, there is a disparity in economic power among Asian countries, which are classified into the developed, developing, and underdeveloped countries by the criteria like the industrial structure and economical indicators. First, the tertiary industry sector in developed countries is larger than that of the primary and secondary ones, and the per

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**This article was developed from my keynote speech presented at the 2010 6th Asian Academic Society for Vocational Education and Trainnig International Conference, in Yunlin, Taiwan, R.O.C. in November, 2010.

capita GDP is mostly over ten thousand dollars, which is much higher than that of other Asian countries. They include Japan (\$39,731), the Republic of Korea (\$17,074), Singapore (\$37,293), and Taiwan (\$15,375). Secondly, the developing countries have concentrated on the secondary industries and the per capita GDP is mostly under ten thousand dollars. These countries include China (\$3,677), Thailand (\$3,939), Indonesia (\$2,329) and Malaysia (\$6,896). On the other hand, in underdeveloped countries, the primary industry constitutes the largest part of the state economy and the per capita GDP is under a thousand dollars. These countries include Cambodia (\$744) and Laos (\$877) (ADB, 2010).

The difference in terms of economical development causes a disparity in types and developmental levels of vocational education and training in Asian countries. Especially, highly skilled workers cultivated from vocational education and training have played an essential role in the rapid development of some Asian countries (Park *et al.*, 2009). Furthermore, vocational education and training satisfies the needs of human resources in a growing industrial society. In fact, developed countries have tried to reform their vocational education and training system in order to meet the demand for intelligent and creative workers based on science and technology developing at an unprecedented pace (Jung, Lee, Kim, Na & Seo, 2000). However, some countries with a low level of economic development somehow show a lack of interest in vocational education and training and the system tends to be weak.

This implies that cooperation among Asian countries is necessary for better development of vocational education and training. In fact, the growing patterns of vocational education and training in developing and underdeveloped countries are similar to those of developed countries in the past. Therefore, this paper reviewed the current status and features of vocational education and training in Asian countries and explored the future directions for their vocational education and training. For this reason, the Asian countries were classified into the developed, developing, and underdeveloped countries by level of national development. This paper focused on vocational education and training systems, administration and policies, students and trainees, teachers, curricular, and industry-school cooperation. Due to limited information and resources, however, this paper didn't cover all Asian countries on the themes.

Recent Trends of Vocational Education in Asian Countries

Shifting from Secondary to Post-Secondary Vocational Education

As indicated in Table 1, the vocational education system of major Asian countries is a type of school which provides vocational education within the national educational system (see Table 1). The countries such as Japan, Korea, Taiwan, China, Malaysia, Indonesia and Cambodia have adopted the 6-3-3-4 system in their basic educational system and they have 9-year compulsory education covering junior high school education. On the other hand, Laos has the 5-3-3-4 system with 5-year compulsory education. Also, while most Asian countries establish and manage special vocational

schools at the secondary and higher education levels, Cambodia does not have any secondary vocational school and in Laos, vocational education is integrated with vocational training.

Table 1
Vocational Education System of Major Asian Countries

Country	School System	Compulsory Edu.	Secondary Vocational Edu.	Higher Vocational Edu.
Japan	6-3-3-4	9	Specialized course Integrated course	Junior college Colleges of technology Specialized training college
Korea	6-3-3-4	9	Specialized vocational high school Meister high school	Junior college Industrial university
Taiwan	6-3-3-4	12	Vocational high school Comprehensive high school	Junior college (2 or 5-year) Colleges & university of technology
Singapore	6-2-2 (2)-4	10	Normal (technical) course	Institute of technical education (ITE) Polytechnics
China	6-3-3-4	9	Vocational junior high schools Specialized secondary school Vocational high school Skilled worker school	Vocational college Technician institute
Malaysia	6-3-3-4	0	Vocational school Technical school	Vocational college Technical college
Indonesia	6-3-3-4	9	SMK (Technical/vocational senior secondary school)	Polytechnic Academy
Laos	5-3-3-4	5	Vocational school	Technical school
Cambodia	6-3-3-4	9	None	Vocational institute

The features of these vocational educational systems can be classified based on the level of national development (see Table 2). First of all, developed countries manage special schools for the purpose of vocational education within the school education system and tend to put more emphasis on higher vocational education than secondary vocational education. This means that they concentrate on training necessary knowledge workers for the tertiary industry. For example, Japan has increased the ratio of general courses in the curriculum since 1975. Especially, integrated courses and unified general and vocational courses have been of greater importance than general courses (Ministry

and vocational courses have been of greater importance than general courses (Ministry of Education, Culture, Sports, Science and Technology-Japan, 2009). Whereas in the phase of higher education, they put emphasis on making full use of colleges and universities for the purpose of vocational education (Yoshimoto, 2009). Likewise, Korea has reduced the number of vocational secondary schools and announced a new plan to reform the existing 691 vocational secondary schools into 350 specialized vocational high schools and 50 Meister high schools by 2015 (Ministry of Education, Science and Technology, 2010). In addition, Taiwan puts more importance on higher levels of vocational education and Singapore tries to reinforce higher vocational education by increasing the number of Institute of Technical Education (Lyau, Lee & Jou, 2003; World Bank, 2008).

Table 2
Features of Vocational Education system in Asian Countries by the Level of National Development

Level of Development	Feature	Country
Developed countries	Managing special institutes for vocational education within the school education system Putting more importance on higher education than secondary one in vocational education Concentrating on growing knowledge workers	Japan, Korea, Singapore, Taiwan, etc.
Developing countries	Focusing on secondary vocational education Managing professional vocational high school within the school education system Concentrating on encouraging the students to become skilled workers	China, Thailand, Indonesia, Malaysia, etc.
Underdeveloped countries	Having weaker systems for vocational education Lower rates of secondary & higher vocational education	Cambodia, Laos, Brunei, etc.

Meanwhile, developing countries also include professional institutes in their school education system but still focus on secondary education, concentrating on training students to help them become skilled workers necessary in the secondary industry such as manufacturing. For example, China has developed human resources with practical skills based on specialized secondary schools, vocational high schools, and skilled worker schools and the country put them in the industrial sites (Kang *et al.*, 2008). Due to policy changes, the secondary vocational education was depressed between 1999 and 2000, which was reversed in 2002 when the State Council convened the First National Conference on Vocational Education. Likewise, Thailand has a high ratio (34.3%) of students attending secondary vocational schools and increases the importance of vocational education (UNESCO, 2008; Choi *et al.*, 2009). Indonesia also has a high ratio (34.3%) of students belonging to secondary vocational schools and tries to increase the ratio up to over 50%. On the other hand, Malaysia, newly industrialized, has a secondary vocational education system relying on technological institutes (vocational course and technical course) (Choi *et al.*, 2009).

In contrast, underdeveloped countries generally have a weak vocational education

system. These poor countries with the per capita GDP under a thousand dollars cannot revitalize a vocational education system. For this reason, the ratio of secondary vocational education is under 10% and that of higher one barely reaches 2% (Yun & Kim, 2007). In Laos, the ratio of students attending vocational schools is still under 10% and what is more, it recently tends to decrease, which shows the insufficient system of vocational education (UNESCO, 2008).

Centralized Administration by the Education Ministry

Central administration agencies in charge of vocational education tend to be responsible for major areas of administration and policies for vocational education. Related legislations as well as the present conditions are as follows (see Table 3).

Table 3
Vocational Education Administration and Policies of Major Asian Countries

Country	Central Administration	Major Policy
Japan	Ministry of Education, Culture, Sports, Science and Technology	Professional high schools for all project (2003)
Korea	Ministry of Education, Science, Technology	Advancement Plan for Vocational education in High Schools (2010) Junior College Specialization & Promotion of Global -level higher vocational education Institutions (2010)
Taiwan	Ministry of Education, DTVE	Plan for Expansion of Investment in Public Construction to Revitalize Economy (2009)
Singapore	Vocational and Industrial Training Board	The Strategic Economic Plan
Brunei	Ministry of Education	Wawasan 2035 Establishing Technical and Vocational education Council (BDTVEC; 1991)
China	Ministry of Education	Opinions on Further Strengthening Vocational education (2004) Decision on Rigorous Development of Vocational education (2005)
Malaysia	Ministry of Education Ministry of Higher Education	Education Act & Private Higher Education Institution Act (1996)
Indonesia	Ministry of Labor and Vocational Training The Directorate Secondary Technical and Vocational education	Indonesia National Strategic Plan 2025 2005-2009 Strategic plan of the MoNE
Philippines	Technical Education and Skills Development Authority	Technical Education and Skills Development Act of 1994
Laos	Ministry of Education	Strategy paper 2005 Establishing National Training Council (2002) TVET-Master Plan 2008-2015
Cambodia	Ministry of Labor and Vocational Training	Educational Strategic Plan: 2001-2005 Rectangular Strategy

Source: The Korean Educational Development Institute. (2007). The development of Asian countries through international education cooperation; Choi & Han. (2009). 2009 Korea-ASEAN education cooperation.

In countries such as Japan, Korea, Taiwan, Singapore, Brunei, China, Thailand, Laos and Malaysia, the Ministry of Education is the center carrying out vocational education. Especially, Malaysia divides the central administration agency in charge of vocational education into the Ministry of Education and the Ministry of Higher Education. Meanwhile, in Cambodia, the Ministry of Labor and Vocational Training is responsible for vocational education. In Indonesia, the Ministry of Manpower and Transmigration, and the Directorate Secondary Technical and Vocational education jointly operate vocational education. According to the trend emphasizing vocational education, the administration agency of each country tries to plan and propel diverse policies for vocational education.

Pushing Policies to Build Infrastructure and Improve the Quality

The features of vocational education policies executed by Asian countries at national level differ in directions from country to country. These different features can be divided into the qualitative improvement of vocational education, establishment and expansion of a base for vocational education, and insufficient national policy efforts (see Table 4).

Table 4
Types of Vocational Education Administration and Policies in Asian Countries

Type	Description	Country
The policies to improve quality of vocational education	Enforcing partnerships with and participation of enterprises in vocational education Reflecting the industrial needs and demands Improving the quality of instructors providing vocational education	Japan, Korea, China, Indonesia, Malaysia, etc.
The policy of establishment and expansion of a foundation of vocational education	Establishing legislations and systems for vocational education Expanding the financial support for vocational education Expanding the ratio of students	China, Indonesia, Singapore, etc.
Insufficient policies for vocational education	Lack of political endeavor at national level	Cambodia, Laos, Brunei, etc.

First, the policies to improve the quality of vocational education are being implemented in many countries regardless of variation of the importance of vocational education, which especially focus on the participation of enterprises in vocational education, vocational education management reflecting the industrial needs and demands and the improvement the quality of instructors providing vocational education. There is a typical example of Korea that propels the policy to reorganize the secondary vocational education schools into specialized vocational high schools and meister high schools to cultivate human resources optimized to meet the demands from the fields and runs training programs for teachers to improve their abilities (Ministry of Education, Science and Technology, 2010; Na, 2009; Na & Jung, 2009). Japan is also reviewing the adoption of super professional high schools and dual systems (Park, Choi, Hong,

Hwang & Jung, 2008; Jang, Kim, Jung & Jung, 2009) and Indonesia pushes ahead with the policies to encourage school-enterprise partnerships, to ease transition from school to career, and to reinforce vocational capability (Choi, 2007).

The policies to establish and expand the base of vocational education are being implemented in countries where the demand for skilled workers has increased. Mostly, the policies are aimed at establishment of laws and systems for vocational education as well as expansion of the financial support and the ratio of students. The most prominent example is China which established 'the Vocational Education Law' in 1997 and announced 'the Decision on Rigorous Development of Vocational Education' in 2005 proposing to accomplish the recruitment of 800-million students participating in the secondary vocational education until 2010. Indonesia also tries to build the foundation for vocational education by signing law, 'the Skills Development Fund Act' in 2004 and 'the National Skills Development Act' in 2006.

On the other hand, the countries with insufficient policies for vocational education are usually the poorest ones. For example, in Cambodia, they lack awareness of the importance of manual and skilled workers and therefore, they have insufficient policies to encourage them (Choi, 2007). In Brunei, in spite of the per capita GDP over 26 thousand dollars thanks to abundant oil resources, its vocational education system is still underdeveloped.

Increasing the Number of Vocational Students in Developing Countries

Students in vocational education system are divided into those in the secondary level and others in higher ones. The ratio of students attending secondary vocational educational institutions of major Asian countries are as follows (see Figure 1). They show a decline in Japan, Korea, Indonesia, Cambodia and Laos and the latter two have very low ratios, below 10%. However, it is a different story in China, Malaysia, Thailand and Brunei and especially in China and Thailand, more than 40% of students participate in vocational education (UNESCO, 2010).

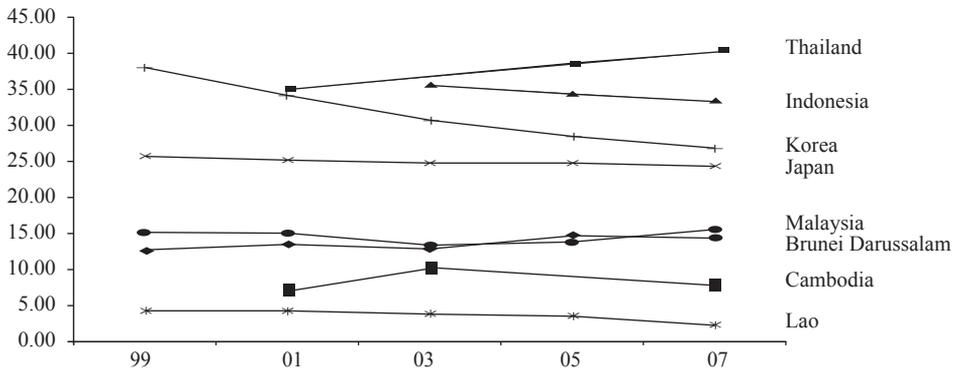


Figure 1. Ratio Change of Students Attending Secondary Vocational Education in Major Asian Countries

Source: UNESCO (2008). Education Statistics.

Meanwhile, the ratio of students in higher vocational education system of major Asian countries is as follows (see Figure 2). Its conspicuous downward trend is obvious in Korea and Brunei while the status quo or a little decrease is observed in Japan, China, Malaysia, Indonesia, Laos and the Philippine.

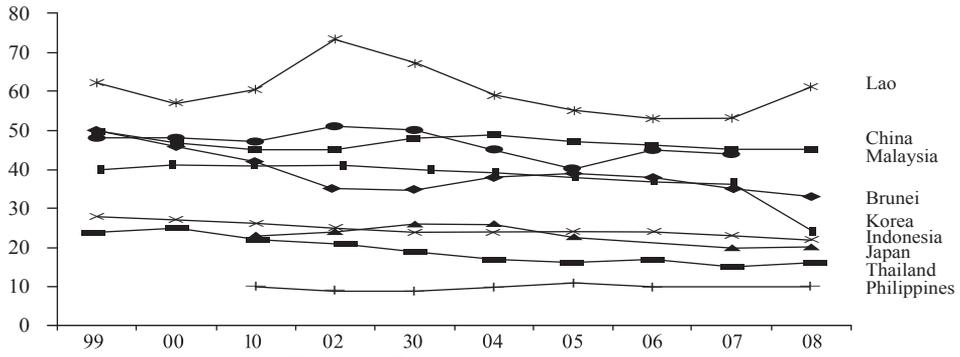


Figure 2. Ratio Change of Students Attending Higher Vocational Education in Major Asian Countries
Source: UNESCO. (2008). Education Statistics.

Their features differ based on the economical level of these countries (see Table 5). First, in developed countries, there is a decrease in number and the rate of entrance to higher educational institutions is increasing. For instance, in Japan, the number of students belonging to specialized (vocational) courses in high schools has gradually decreased since 1965. It reached 32.0% of that of the general course in 2007. Also, according to the fact that 54% of high school graduates entered colleges or universities while 19% were employed proves that the weight of vocational education has shifted to higher education (Ministry of Education, Culture, Sports, Science and Technology-Japan, 2009). In the meantime, there is a decline in the number of the students in the secondary vocational education system in Korea and it reached 480,826, 56.5% of all secondary students in 2009 (Educational Statistics and Information Research Division, 2009). In Singapore, the enrolment in the Institute of Technical Education (ITE) is also increasing and images of vocational education and training have improved dramatically.

On the other hand, in developing countries, the number of students in vocational education system is on the rise, which is a trend led by the secondary vocational educational institutions. China is the representative example whose number of students in specialized secondary schools and vocational high schools is on the continuous increase and most of them are employed in industrial sectors on their graduation (Kang *et al.*, 2003; Korean Educational Development Institute, 2007). According to statistics of the MoE (China), in 2009, 8,685,200 students were enrolled, which is 1,203,000 more than the number in 2006 (Moe 2010), and the employment rate of graduates from secondary vocational schools remains above 95%. Likewise, in Malaysia, Thailand, and the Philippines, vocational education and training is also gaining momentum as more

youths are more interested in enrolling in this type of education. Indonesia is even more ambitious that DSTVE of Indonesia is planning to increase enrolment ratios between general school to vocational school to 30:70 by 2015 (DTVE, 2006).

Meanwhile, the ratio of students of secondary vocational schools in underdeveloped countries was low. The number is even falling these days (Yun *et al.*, 2007; UNESCO, 2008). For instance, in Laos, the ratio of students in vocational schools was below ten percent. It is declining in recent years (Jung *et al.*, 2008).

Table 5
Features of Student in Vocational Education of Asian Countries by the Level of National Development

Level of Development	Feature	Country
Developed countries	Decreasing the number of students Increasing the rate of entrance to higher educational institutions	Japan, Korea, Singapore, etc.
Developing countries	Increasing the number of students The rise led by the secondary vocational educational institutions High rate of employment after graduation	China, Malaysia, Thailand, Philippines, Indonesia, etc.
Underdeveloped countries	Low ratio of students in vocational education system Decrease in the ratio of students in vocational education	Cambodia, Laos, etc

More Vocational Teachers in Developing Countries

The ratios of teachers in secondary vocational education system were studied to identify vocational teachers. The ratios of such teachers in major Asian countries are as follows (see Figure 3). The ratios are declining in Japan, Korea, Thailand and Laos while they are increasing in China and Cambodia. In Indonesia, a certain level observed in 2006 is still maintained.

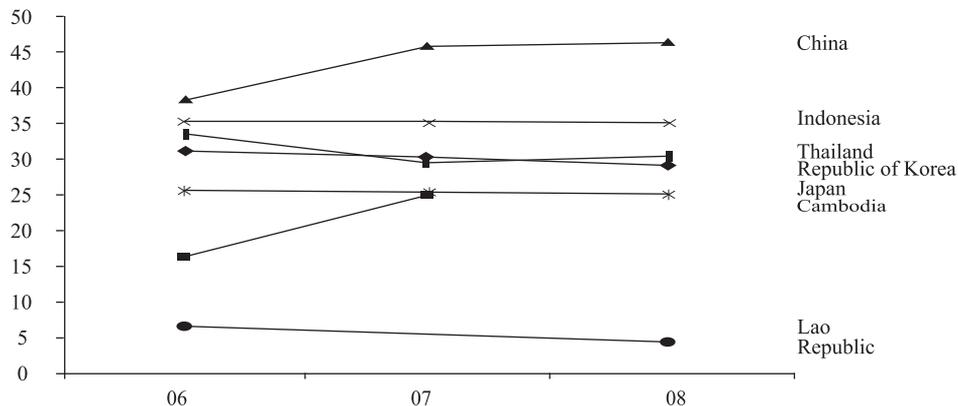


Figure 3. Ratio Change of Secondary Vocational Teachers of Major Asian Countries
Source: UNESCO. (2008). Education Statistics.

Their features differ according to the level of economic development (see Table 6). First, in developed countries, though the numbers went on declining, the governments were committed and exerted diverse efforts to improve their quality control. For example, in Japan, despite a numerical decline in total number of teachers in the 1990s, they put various efforts into acquiring quality teachers for vocational education by adopting invitation system for principals and evaluation of teachers.

Meanwhile, in Korea, the number of teachers of vocational high schools decreased from 42,360 in 1999 to 36,077 (82.5% of the former) in 2009 (Educational Statistics and Information Research Division, 2009), while the country tried to improve their quality by starting a 'system of employing teachers involved in both industry and business', 'principal public subscription system' and 'teacher evaluation system'.

In contrast, in developing countries, the number has been on the gradual increase, mainly led by secondary vocational educational institutions. Also, they tried to establish and expand teacher education system to satisfy the demand for vocational education. For instance, China spent its time and energy to expand the institutes' function to educate teachers for vocational education as well as their education and training periods (Lee *et al.*, 2007).

In underdeveloped countries, the ratio of teachers was low and the teacher education system was unsatisfactory. In Cambodia, their quality and experience was inadequate because of the lack of preliminary training and training opportunities at work (Choi *et al.*, 2007; Park & Jang 2008). Yet, they started master's courses to train top-level human resources, which are still concentrated in urban areas (Yun *et al.*, 2007). Laos has problems with its limited degree programs and the absence of separate master's or doctoral degree programs (Jung *et al.*, 2008).

Table 6
Features of Vocational Teachers in Asian Countries by the Level of National Development

Level of Development	Feature	Country
Developed countries	The number of teachers declining Diverse efforts for quality control	Japan, Korea, etc.
Developing countries	Increasing the number of teachers Establishing and expanding the teacher education system	China, Indonesia, etc.
Underdeveloped countries	Low ratio of teachers Unsatisfactory system to educate teachers	Cambodia, Laos, etc.

Operating the Industry Field-Based Curricular

The vocational education curriculum is a systemic and organized plan, the organized educational contents and learning activities to achieve the goal of vocational education. The details of major Asian countries are as follows (see Table 7). The countries such as Japan, Korea, Taiwan, China and Malaysia have a national curriculum while Laos and Cambodia have built no or weak curricula. Also, according to diverse industry needs, the basic frame of vocational education curriculums in Korea, Taiwan and Indonesia is

regulated within the national curriculum, but detailed subjects and class hours are differently operated by school or regional characteristics.

Table 7
Vocational Education Curriculum of Major Asian Countries

Country	Curriculum	Description
Japan	8th Reform of the National Curriculum Standards (1999)	Total number of subjects decreased by 20%
Korea	2009 Revised Curriculum	Basic frame regulated by the national-level curriculum, but the rest of detailed subjects and class hours are differently operated based on school characteristics
Taiwan	Provisional Curriculum Outline for Vocational Schools (2005) Curriculum Outline 2009	'Curriculum Outline 2009' considers the common abilities an 18-year-old student should possess Increases the number of credits students need to earn from their professional and practical training courses The new curriculum consists of Ministry-prescribed courses (obligatory) and school-prescribed courses (obligatory and elective).
China	Lists of majors for secondary vocational schools	Abolished inadequate majors and created new ones according to the industrial demands
Malaysia	Education Act (1996) 'Educational (National curriculum) Regulation' (1997)	Provide a flexible and broad curriculum Include the contents, approaches and assessments Integration of technology, practical and drawing (70%) Modular and competency based learning
Indonesia	-	Basic fame regulated by the national level curriculum, but the rest of extracurricular activities are differently operated based on local characteristics
Laos	National level curriculum is not organized, systemic	Development curriculum by educational center
Cambodia	There is no national level curriculum	-

Source: Choi et al. (2007). Survey research on the vocational education and training in the Asia-Pacific region: Cambodia. ; Yun et al. (2007). The educational status and future challenges in Cambodia. ; Ministry of Education in Malaysia. (2010). National curriculum. Retrieved from <http://www.moe.gov.my/?id=114&lang=en> ; Ministry of Education in Taiwan. (2010). National curriculum. Retrieved from <http://english.moe.gov.tw/ct.asp?xItem=9325&ctNode=504&mp=2>

Most countries have similar vocational education curriculums. However, there were differences in their management; some of them were specialized according to the industrial demands while others focused on common skills. Also, there was a feature to reinforce articulate education. 'Specialized according to the industrial demands' is to cultivate bespoke human resources reflecting the needs and demands of a specific industrial field. Especially, Korea has reorganized its secondary vocational educational

institutions into specialized vocational high schools and meister high schools and tries to redesign educational programs to develop customized human resources specialized according to the demands of the field (Ministry of Education, Science and Technology, 2010). Also, it started to reinforce industry-school cooperation by adopting customized educational programs in higher vocational educational institutions. From 2007, China abolished inadequate majors and created new ones according to the demands for socioeconomic development by releasing the "Lists of Majors for Secondary Vocational Schools" and establishing the "Lists of majors for 5-year-course Higher Vocational Education." Likewise, Cambodia tried to reorganize a new curriculum into modules to improve the present condition that does not flexibly cope with changes in technology and labor markets.

In contrast, the latter concentrates on "common skills" (soft skills, employability skills) rather than technical details required by industrial fields, encouraging students to finish affiliated subjects with considerable latitude. For example, Japan decreased the total number of subjects by 20% to focus on the basic of specialty of the subjects related to specific profession and clarified each subject's contents and methods to deal with them according to the new governmental guidelines for teaching in high schools implemented in April, 2003, which also diminished the number of compulsory professional credits from over 30 to over 25 as well as that of standard subjects into two, the basic one and 「Project Research」. Furthermore, it removed the regulation of standard departments to encourage the initiative of each school (Lee *et al.*, 2007). Likewise, Brunei, Indonesia, Malaysia, Singapore, and the Philippines have been proactive in integrating the soft skills in their curriculums.

Meanwhile, articulated education is reinforced and managed by many countries. It can be done as horizontal articulation (at the same level of education) and/or vertical articulation (between lower and higher levels of vocational schools). Especially, vertical articulation is to encourage students to enroll in vocational education and to avoid repetition of courses. Typically, in Japan, the "credit system" was introduced in full-time secondary schools in 1993. It aims to provide education to a variety of students at any time in accordance with their own need. As of 2007, there were 785 schools of this kind (MoECSST of Japan, 2008). Also, in Malaysia, the TechPrep initiative recognizes some of the courses taken at the secondary level to be matriculated at higher levels. The 2+2+2 program offers students advantages because the vocational education courses taken during the last two years in high schools as well as two years of participation in postsecondary vocational and institutions will qualify the students to receive diploma certificates, and if they continue for two more years of education at the university level, students will be qualified as undergraduate degree holders. Likewise, China adopts the models of 3+3, 3+2 and 4+2. Brunei is introducing changes in the vocational education framework which includes the introduction of the 3-tier technical vocational education (national skill certificate, diploma, and technical degree). Thailand is also introducing similar arrangements.

Table 8
Types of Vocational Education Curriculum in Asian Countries

Type	Description	Country
Specialized to meet the industrial demands	Specialized curriculum for specialized manpower by industry Subjects reflecting the needs and demands of a specific industrial field	Korea, China, Cambodia, etc.
Focusing on common skills	Subjects related to basic industrial abilities Focusing on the basic specialty of subjects	Japan, Brunei, Indonesia, Malaysia, Singapore, Philippines, etc.
Reinforcement of articulated education	Recognizing or matriculating credits of courses from one school to another Encouraging students to enroll in vocational education and avoiding repetition of courses	Japan, Korea, Taiwan, Brunei, China, Malaysia, etc.

Reinforcing the Industry-School Cooperation

Industry-school cooperation means interchanges of human and material resources required for education and researches between enterprises and schools for long-term development of the society and the country. This way, schools can be provided with financial supports as well as facilities and human resources for training of practical skills while enterprises can make better use of laborers prepared for actual industrial sites (Kim, 2005; Lee, 2003). The current status of major Asian countries is as follows (see Table 9). Japan and Malaysia have their major programs such as dual system while Korea and Taiwan focus on hands-on experiences and delivery of educational contents related to enterprises. China has similar programs to the latter two, but what is unique is the dual degree program to give a student both diploma and license if he/she finishes vocational education. Lastly, Cambodia doesn't have any partnership programs shared between educational institutions and companies, resulting in difficulty in finding jobs after graduation.

Table 9
Industry-School Cooperation Programs of Major Asian Countries

Country	Cooperation Programs
Japan	Dual System of Japanese version (2 days in school, 3days in industry), Internship education
Korea	Field Practice on professional subject, Internship, Industry-customized curriculum, School-based Enterprise
Taiwan	On-the-job training, Industry-Academia Partnership Program (2006), Simulation
China	Internship, School-based Enterprise
Malaysia	National Dual Training System
Cambodia	No relation with private enterprise

Source: Korean Educational Development Institute. (2007). The development of Asian countries through international education cooperation. ; Choi et al. (2009). 2009 Korea-ASEAN education cooperation.

In Asia, the countries with established vocational education system put emphasis on industry-school cooperation concentrating on skills immediately used in related industrial sites, which can be sorted into field practice-based education, education specialized for specific industry and school-based enterprises (see Table 10). Field practice-based education helps students to acquire knowledge and skills as they practically experience on industrial sites based on short-term or long-term programs of enterprises. Typically, in Japan, internship education was introduced in the late 1990s though it still remained an attempt in a small way. China has diverse models such as 'specific training', 'cooperative education such as 2+1' and 'cultivation-education-employment' while Taiwan runs 'academic-industrial partnership program' connecting secondary vocational school, higher vocational school and companies adopted in 2006 (Kang *et al.*, 2008; Ministry of Education, 2010).

Education specialized for specific industry is to reorganize the educational contents of vocational educational institutions in order to fulfill the industrial needs for knowledge and skills according to changes of the industrial society. Japan managed 'professional high schools for all projects' to invigorate local industries by using human and material resources of professional high schools. Korea adopts 'the industry-school commissioner system' to prompt the cooperation at the level of high school, which encourages companies to develop the curriculums. Taiwan offers 'Simulation' with the same facilities as those on sites, which enables practical training in vocational schools.

Lastly, in school-based enterprises, the principal as a CEO hires teachers and students and produces and sells goods and provides services, which makes possible on-site experiences of schools participating in creating jobs and service activities. In China, schools establish and manage companies to cultivate human resources by making use of their own technology and capital (Kang *et al.*, 2008).

Table 10
Types of Industry-School Cooperation Programs in Asian Countries

Type	Description	Country
Field practice-based education	Field trip through short-term programs Field training through long-term programs	Japan, Korea, Taiwan, Malaysia, etc.
Customized education for industry	Developing the curriculum with companies Using the same facilities as those on sites	Japan, Korea, Taiwan, China, etc.
School-based enterprise	A Simulated or actual business conducted within a school	Korea, China, etc.

Recent Trends of Vocational Training in Asian Countries

More Emphasis on Training by Private Institutions in Developed Countries

Vocational training systems consist of public training by the central institution and private training by enterprises. Vocational training systems of major Asian countries are as follows (see Table 11). In most countries, vocational training is operated by both

public organizations and private companies while the management of each system differs. In Japan, private training is of great importance while in Singapore and China, vocational training is mainly performed by public training organizations (ITE, Technical institution). On the other hand, Laos has a weak foundation due to the lack of agencies that are responsible for vocational training of industrial technology.

Table 11
Vocational Training System of Major Asian Countries

Country	Public Vocational Training System		Vocational Training System by Private Institution
	School	Institution	
Japan	Polytechnic junior colleges, polytechnic colleges, etc.	Human resource development center, etc.	Company, industry group, vocational training corporation, etc.
Korea	Polytechnics, Korea university of technology, etc.	Human resources development institutions of the Korea Chamber of Commerce & Industry, etc.	Private training corporations, facilities designated by the Ministry of Labor, etc.
Taiwan	Polytechnics, etc.	Public training center, etc.	Public company training center, personal or industrial training authorities, etc.
Singapore	Institute of Technical Education (ITE), etc.	Vocational training center, etc.	Training center in private company, etc.-
China	Vocational schools/colleges' short-term trainings, etc.	Employment training center	Company, private organization, etc.
Indonesia	-	BLK (under auspices of MoMT)	Private training institutions, etc.
Laos	Vocational/technical school, etc.	National vocational training center, etc.	-
Cambodia	-	Training institutions of the Ministry of Labor, the center of the Ministry of Women, etc.	Training centers of private companies, NGOs' vocational training, etc.

Note: ' - ' is that there is no information of the country.

Source: The Korean Educational Development Institute. (2007). The development of Asian countries through international education cooperation; Choi et al. (2007). Survey research on the vocational education and training in the Asia-Pacific region: Cambodi; Jung et al. (2008). Survey research on the vocational education and training in the Asia-Pacific region: Laos; OECD (2009). Learning for jobs OECD reviews of vocational education and training.

Similarly to vocational education systems, vocational training systems are distinguished by the economical level of each country (see Table 12). Developed countries established the system for lifelong development of vocational competency and

reinforced the participation of private training organizations. This can be interpreted that they possess the stable employment structure and concentrate on vocational training in order to improve the quality of newly employed and existing workers' competency. Japan legislated the 'Vocational Education Act' into the 'Vocational Ability Development Promotion Act' in 1985 in order to build a system for lifelong development of vocational competency which concentrates on 'in-work training system' operated by companies and assisted by public training (Lee, 1999). Korea also abolished and eased the regulations of private training and encouraged profit-making corporations to participate in it (Jang, 2003), which resulted in quantitative growth of private training from 3,121 in 2005 to 5,105 in 2008. Likewise, Taiwan is promoting employed workers' training as companies are installing vocational training centers. This aimed for the improvement of quality of human resources to be adaptable to the changes of industrial structure (Kang, 2003).

Table 12
Features of Vocational Training System in Asian Countries by the Level of National Development

Level of Development	Feature	Country
Developed countries	Establishing the lifelong vocational competence development system Reinforcing the participation of private training organizations	Korea, Japan, Taiwan, etc.
Developing countries	Focusing on the public operation Concentrating on Pre-employment training Vocational education and vocational training separately managed	China, Malaysia, Brunei, etc.
Underdeveloped countries	Poor systems for vocational training Lack infrastructure for vocational training	Cambodia, Laos, etc.

Meanwhile, in developing countries, vocational training systems focus on the public operation to grow newly employed workers and manage vocational education and vocational training separately. They concentrate to train newly employed workers because over 30% of the economic population focuses on the primary industry despite the shift of the central industry to the secondary industry. For example, China proclaimed the "Vocational Training Center Management Rule" in 1994, assigning technical schools and training centers the primary responsibility of vocational training and establishing high-quality technical schools to train top-level human resources (Wang, 2003). Also, they implement the 'System of Labor Reserve Duties (2000)' to train newly employed workers by providing the graduate-to-be with pre-employment training for 1-3 years.

In contrast, underdeveloped countries have poor systems for vocational training. This shows that both the industrial and employment structures concentrate on agriculture, which inactivates vocational training, and their vocational trainings have been provided partly. Cambodia excludes vocational training from its educational system and offers the training by facilities through NGO or existing ones because of the

lack of infrastructure for vocational training (Choi *et al.*, 2007). In Laos, vocational training programs were provided by each division of Ministry of Labor and Social Welfare and they mainly consist of short-term training programs because of the insufficient infrastructure (Jung *et al.*, 2008).

Training Administration by the Labor or Employment Ministry

We can explore the administration and policies for vocational training by focusing on the central administration agencies in charge of vocational training of each country, the direction to reform and reorganize them, its support policies, and the related legislations and systems (see Table 13). In Japan, Korea, China and Cambodia, the so-called Ministry of Labor takes on vocational training, while in Singapore, does the 'Vocational and Industrial Training Board'. In Laos, the 'Higher Technical Vocational Education Department' is in charge of both vocational education and training. In Malaysia, several divisions partially manage it.

Table 13
Vocational Training Administration and Policies in Major Asian Countries

Country	Central Administration	Major Policy
Japan	Ministry of Health, Labor and Welfare	The 7th Basic Plan for Vocational Ability Development (2001-2005) The reports of "symposium on globalization and future of youth in Asia" (2004)
Korea	Ministry of Labor	Worker's Skills Development Act (2004) Worker's Skills Development Card System (2008)
Taiwan	Employment and Vocational Training Administration Council of Labor Affairs	Enacting the Vocational Training Law (1983) Establishing the Labor Committee and supporting private companies (1992)
Singapore	Vocational and Industrial Training Board* Productivity and Standard Board	-
China	Ministry of Human Resources and Social Security	System of Labor Reserve Duties (2000) The 11th Five-year Plan (2006-2010)
Malaysia	Ministry of Human Resource and Development Ministry of Community Development	Skilled Development Fund Act (2004) National Skills Development Act (2006)
Lao	Higher, Technical Vocational Education Department*	Strategy paper 2005 Establishing National Training Council (2002)
Cambodia	Ministry of Labor and Vocational Training	-

Note: '*' is an example integrating vocational education with training system.

Source: Choi *et al.* (2007). Survey research on the vocational education and training in the Asia-Pacific region: Cambodia. ; Jung *et al.* (2008). Survey research on the vocational education and training in the Asia-Pacific region: Laos. OECD. (2009). Learning for jobs OECD reviews of vocational education and training.

Enacting Laws and Establishing Strategic Plans

The features of vocational training policies executed by Asian countries can differ by the level of economic development (see Table 14). First, developed countries reinforce the support to train participants and small and medium-sized enterprises as well as the connection with vocational education. Japan runs 'the personal account system' which shifts employer-centered vocational training to individual-centered training, and establishes license linkage system in all subjects related to vocational training, which facilitate receipt of certificates and employment upon graduation. In Taiwan, if a person passes an achievement test after on-site experiences for a certain period of time, he/she will receive a diploma as a graduate from the department of the affiliated school. Singapore regards engineering or technician certificates on the same footing with diplomas of general education and encourages excellent graduates from vocational training institutions to enter engineering departments of colleges and finish degree programs.

Meanwhile, developing countries enact related laws for training vocational competence, activate the financial support to reinforce vocational training, and establish the qualification system at a national level. Malaysia established 'the Technology Development Funds Act' in 2004 to increase the budget for vocational training and to support trainees directly. Furthermore, the country signed the 'National Technology Development Act' which enables the cultivation of personal capability needed at work through the technical training programs (Choi *et al.*, 2009). Also, the National Vocational Training Council (NVTC) under the MoHR is responsible to issue recognized certificates to individuals based on the NOSS (National Occupational Skills Standard; outlining the skills and competencies required of workers in various skill areas or occupations). There are 5 levels of certification, namely Malaysian Skills certificate (MSC) Levels 1 to MSC Level 5. In Indonesia, the MoM acts as a national executive agency in preparing for and implementing the Occupational Skills Standards (OSS). Under the OSS, there are three levels of skills competencies including National Skills Test (NST) Grade 1, followed by Grade 2 and Grade 3. Brunei also recently planned the SPN21 policy mainly led by BDTVEC, establishing the qualification structure of 3 steps (Choi *et al.*, 2009).

In contrast, underdeveloped countries have poor systems for vocational training. In Cambodia, they have difficulty in expecting human resources and the demand for them due to the lack of information systems for labor market and the instability of economic development, and failed to build a proper foundation because the regulations for vocational training were up in the air (Choi *et al.*, 2007). The absence of system to qualify one's possessed knowledge makes the skills acquired informally not be properly estimated and the difficulty of horizontal and vertical shifts prevents a person from building his/her career and changing specialties (Choi *et al.*, 2007). Laos does not have a central organization responsible for vocational training of industrial technology and a qualification system to develop skilled workers. Yet, recently, the country tries to prioritize development of human resources as they have recognized that they can substantially create jobs by developing young people into skilled workers, substituting

them with workers from overseas, and giving them the opportunities to work abroad (Shin, 2002).

Table 14
Features of Vocational Training Administration and Policies in Asian Countries by the Level of National Development

Level of Development	Feature	Country
Developed countries	Reinforcing the support to train participants Reinforcing the support to small and medium-sized enterprises Reinforcing the connection to vocational education	Korea, Japan, Singapore, Taiwan, Etc.
Developing countries	Enacting related laws for vocational ability development Supporting vocational training with employment funds Establishing the National Qualification Framework	China, Indonesia, Malaysia, Etc.
Underdeveloped countries	Poor systems for vocational training	Cambodia, Laos, Etc.

More Training for Incumbent Workers in Developed Countries

The features of vocational training participants vary based on the economic level of countries (see Table 15). First, in developed countries, more and more office workers, elderly people, females and foreigners participate in vocational training. In Japan, realizing the seriousness of the employment problem of knowledge workers, they adopted vocational training and qualification system, established the Lifelong Professional Ability Development Center (Ability Garden) in 1997, and introduced vocational training system for foreign workers. In Korea, based on the reinforcement of improvement training for office workers, the number has doubled from 2,034 thousands in 2004 to 4,032 thousands in 2008. And the government started supporting promotion of essential performance abilities for small-medium businesses, vocational training for North Korean refugees and training for small-scale businessmen, resulting in the participation of diverse recipients.

Meanwhile, in developing and underdeveloped countries, the ratio of students and the unemployed among participants is getting higher but the residents of the rural areas are provided with relatively less opportunities. China tries to train prospective graduates and unemployed trainees. Malaysia still concentrates on the training of male Malaysians performed by public vocational training centers (Choi *et al.*, 2009) while Indonesia succeeded in prompting private training organizations to train prospective workers to be hired abroad (Jeong *et al.*, 2007). Laos offers skill-oriented vocational training to graduates from elementary and junior high schools (Jeong *et al.*, 2008).

Table 15
Features of Vocational Training Participants in Asian Countries Based on the Level of National Development

Level of Development	Feature	Country
Developed countries	Increasing the rate of employed workers in vocational training Diversifying the vocational training participants	Korea, Japan, Singapore, Taiwan, etc.
Developing countries	Increasing the participation of unemployed workers	China, Thailand, Indonesia, Malaysia,
Underdeveloped countries	Widen the gap between urban and rural areas	Cambodia, Laos, Brunei, etc.

Emphasizing the Improvement of Training in Developed Countries

In most Asian countries, recipients of vocational training are divided into students/unemployed people (preparation training) and employed workers (improvement training). However, some manage the improvement training under the lifelong education system and training for practical skills or vocational adjustment. The improvement training under the lifelong education system aims at developing one's existing competence to the higher level under the stable employment environment by industry, which is mostly offered in developed countries. In Korea, 94.2% of the participants in "workers' skills development project provided by the Ministry of Labor " in 2005 were in the employed workers' training. 97% of these people took part in the improvement training (Korea Employment Information Service, 2005). In Japan, it is universal for vocational training courses to focus on basic knowledge while in-work education and training programs (OJT) operated by companies concentrate on professional knowledge.

The training for practical skills or vocational adjustment is usually provided in developing and underdeveloped countries in order to train the human resources to be put in the secondary and tertiary industries in a short period of time. China proclaimed 'the Ninth 5-year Vocational Ability Development Plan' and the '2010 Long-term Plan'. They intends to develop skilled workers to satisfy the demands from the labor market (Wang, 2003) while Brunei manages short-term programs for office workers to raise domestic skilled workers because of the high level of dependence on foreign workers (Choi *et al.*, 2009).

Table 16
Types of Vocational Training Programs in Asian Countries

Type	Description	Country
Vocational competence improvement training	Enforcing the employed workers training Reinforcing consumer-oriented right of choice for the trainees	Korea, Japan, Singapore, Taiwan, etc.
Practical skill and vocational adjustment training	Enforcing the practical skill and adjustment training Concentrating on short-term training	China, Cambodia, Laos Brunei, etc.

The Future Direction of Vocational Education and Training in Asian Countries

Establishing the Effective Collaboration and Networking System

The governments of Each Asian countries ought to offer a clear outlook, establish a cooperative system, share the know-how of vocational education and training, and play an important role in the financial support in order to quickly meet the demand of times such as globalization and advanced science and technology. Massive investments to vocational education and training are offered by the Asian Development Bank and other affiliated organizations. However, sometimes, these investments are placed in wrong directions because their political directions and forms of support often ignore the special circumstances of countries. Especially, the continuous financial support without technology transfer causes a side effect such as too much reliance on support. That is why the research institutions and people in charge of vocational education and training should build up the international cooperative system, share the know-how, and promote regular exchanges in order to develop vocational education and training in Asian countries.

Strengthening the Connection between the Secondary and Post-secondary Vocational Education

As a country's economy and industry develops, occupational skills based on intelligent and creative abilities are required. At the same time, not only the skilled, but also professional workers need to be developed. In order to achieve this, a foundation for occupational education at a higher level rather than only that at the high school level will need to be established. Education shall avoid repetitive and overlapping contents while brining about consistency, continuity, and continuance to reinforce the effectiveness of occupational education. These can be achieved through affiliation and liaison among vocational education institutions.

Asian developed countries, from the lifelong educational point of view, try to substitute the effective continuous education system connecting vocational education institutions for the formerly inefficient, ineffective and inconsistent one but they are not always successful. For example, in Korea, it is difficult to effectively connect among the vocational education institutions because they have failed to perform their own functions and roles. In developing countries in Southeast Asia, they still have vocational education and training at the secondary level, failing to upgrade it with higher levels of their education system (Choi *et al.*, 2007).

In order to develop the vocational education system from the lifelong educational point of view, therefore, it is necessary for Asian countries to implement policies for the development of vocational education at a high school or higher levels and to increase the effectiveness and efficiency by vertically connecting vocational institutions and sharing their roles after an overall examination of the vocational education system.

Reinforcing the Industry-School Cooperation

It is essential to set up a close cooperative system to manage vocational education and to develop the specialty of students and teachers, for which the developed countries put emphasis on the introduction of the dual system from Germany, internships and work experiences in companies, but they are not always successful. In some countries, vocational schools often fail to make connections with private companies to secure the employment of their graduates. Therefore, the national policies and the cooperation of enterprises are required to maintain a close cooperative system between vocational education institutions and companies in order to help the courses to meet the demands of companies and to secure the employment of human resources cultivated through the courses.

Integrating the Vocational Education and Training

The continuous increase of the youth unemployment consistently shows that their academic ability does not meet the demand from industrial sites. To overcome this problem, it is necessary to connect the vocational education with the vocational training, for which we should develop a partnership between schools and companies and provide internships and work experiences. In managing this partnership, it is essential to analyze the mutual demands and to keep a balance between theory and practice for effective hands-on experience.

Enhancing the Quality of Teachers

Each instructor should possess practical knowledge, excellent teaching ability, and abundant performance ability. In developing countries, however, the ratio of teachers with diplomas over bachelor's degrees is low and so is the quality of teachers in charge of vocational education. In developed countries, they manage special education centers and systematic courses to cultivate teachers to take responsibilities of vocational education. It is vital to manage special institutions that develop professional instructors and on-site practice-based education according to the special traits of each field if we want to secure highly competent teachers in vocational education.

Amending and Enacting Laws and Regulations

Developed countries in Asia try to amend laws and regulations such as the fundamentals of the Education Acts, the School Education Acts, and the Vocational Competency Development Acts and so do some developing countries. However, in order to develop vocational education and training and to establish the systematic infrastructure, the government should enact related laws and based on the implementation of laws, various governmental departments and divisions should formulate and implement diverse policies.

Securing a Stable National Budget for Vocational Education and Training

Most developing countries in Asia see the necessity of vocational education and training, but cannot afford the systematic management of institutions, programs and teachers because of their insufficient finance. What makes matters worse is these governments' high level of reliance on foreign aid as the huge part of their budget for education is backed by foreign aid. That is why Asian countries need to expand the finance for education. Together, developed countries should support them by exchanging and sharing the know-how to invigorate the international vocational education and training. For example, Singapore tried to build the foundation by investing 25% of its national budget for development of general and vocational education after the Emancipation.

Expanding the Role of Private Vocational Training

In most Asian developing countries, the public sector tends to lead vocational training. Most of the government-led training concentrates on growing new sources of human resources while only a small of part it is given to the vulnerable social classes. Yet, it is obvious that we need vocational training to develop abilities of office workers in their performance, which is usually operated by private companies. That is why we should expand the vocational training by supporting private vocational training centers and their participants directly.

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The Exploration and Inspiration on the Comparison of Technological and Vocational Education between both in Taiwan and Japan

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ABSTRACT After the World War II, Japan and Taiwan both have transformed the traditional farming society into the modern industry and commerce society. The politics, economy, culture, and education of the two countries are all impacted by the modernization, industrialization, and technology. Facing the structural adjustment and re-establishment, the vocational and technological education is closely linked with the enterprise and the industry. This paper mainly discusses the development evolution, administration system, vocational training, characteristic, innovation, problems, tendency and forecast of the comparison between Japanese and Taiwanese vocational and technological education. The authors hope that the past experiences of the Japanese and Taiwanese vocational education can enforce the cooperation between schools and enterprises, build the excellent quality education study, and think deeply how to plan implements into the direction of the two countries' vocational and technological education. It's important to lift the technique innovation, to train the outstanding omni-directional technique vocational talented person, to promote the social progress and to strengthen the country competitive power.

KEY WORDS technological and vocational education, career and technical education, school system, vocational training, lifelong learning

Introduction

In these recent years, according to the society's progress, the economical development, and the globalization tendency, the educational level and the living standard of people's have enhanced a lot. From the conception of the education development of history, the education may divide into the education for culture and the education for work. The education is one of the main keys of the national development and the technique vocational education is one important part of the educational works

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(Chuang, 2010). Comparison education is one kind of application social sciences theories and methods to study the domain of the international issues and hopes there will be the deep understanding regarding the local people and the education.

Taiwan and Japan are the neighborhood in the geography area. There has been the very big origin relationship between them since the end of the Qing Dynasty. In the Treaty of Shimonoseki, mainland China ceded Taiwan will to Japan. In 1945, after Taiwan recovered from Japan, but the Japanese-style culture still affects Taiwan. The following will discuss the similarities and differences of Taiwan's and Japanese's technique vocational education such as historical evolution, present situation, education system, curriculum, vocational training, and so on. Describing education similarities and differences phenomenon which the different educational systems presents and estimating the related education of the possible influence in Japanese and Taiwan's phenomenon will be helpful to improve Taiwan educational system's future development and will provide Taiwan about the findings of the technique vocational education to develop the concrete improvement suggestion in the future.

This article uses the literature of analytic method of the quality research, of educational system. The related memoir, the books and the homepage capital in view of Taiwan and Japan will be used in the discussion and the analysis. Speaking of studying area, this research only makes the comparison to Taiwan and Japan, but not concerning the other countries. Speaking of the object of study, it only makes the general summary about the two countries' general education, and makes the analysis especially on the two countries' technique and vocation education. Speaking of the research curriculum, this research refers to the curriculum only to make the discussion on the informal curriculum but no including the potential curriculum.

The Comparison of Basic Data

1. To understand safety-hygienic cognitions and attitudes of college students who are working in labs or workshops.
2. To examine differences of safety-hygienic cognitions and attitudes between/among college students in terms of their backgrounds.
3. To explore the relationship between safety-hygienic cognitions and attitudes of college students who are working in labs or workshops.

Taiwan Aspect

The island of Taiwan and the peripheral attached islands are Penghus including Jinmen archipelago, Nansha Islands, Dongsha Islands and the Mazu islands. The area is total 36,188km². There are 23,000,000 people and there were born more than 410,000 people a year in 1980s, proximately more than 320,000 people a year in 1990s, but dropped to more than 240,000 people a year. According to the Executive Yuan Planning headquarters statistics pointed out that Taiwan birth rate has dropped to about 1.18 people a year in 2006, and it demonstrated Taiwan has also faced the decreasing

baby impact.

The Gross Domestic Production (GDP) is NT\$12,396 in 1995, NT\$13,604 in 2002 and NT\$17,576 in 2008. Meanwhile, The secondary education accounts for the 96 percentage of the related age population, and the higher education accounts for 46 percentage of the related age population. The compulsory education age limit is 9 years old and the primary education age limit is 6 years old.

Japan Aspect

In the Asian northeast's area, Japanese nation is composed of four main islands, Honshu, four countries, the Nine Provinces and more than 6000 islands from the north to the south respectively. The total area is 377,915km², and there are 127,757,000 people of the total population for top 10 in the world. In 1940s just after the World war II, there's, the average birth number approximately 5. From 1960s to 1970s, the birth rates also maintained 2.13, but 2 below in 1975 falls, marching into "the decreasing baby age society" in 1997, and the given birth number drop to 1.29 in 2005. The total population also starts to reduce, and demonstrated that the Japanese society marching into the depopulation, "decreasing baby" time.

The Gross Domestic Production (GDP) is NT\$39640 in 1995, NT\$31,269 in 2002, and NT\$39,727 in 2008 which are much higher than Taiwan's. The compulsory education age limit is 9 years old and the primary education age limit is 6 years old.

Inspiration from the Comparison with Taiwan and Japan

According to the basic data, it's shown that Taiwan and Japan belong to the island geographical position. Taiwan's population approximately is 1/10th Japanese, and the population approximately is 1/6th to Japanese; Taiwan's GDP is inferior to Japan, but the educational system with the comparison is similar.

Facing the future, both of the two areas will face the decreasing baby the similar tendency, but Japan will have "decreasing baby society countermeasure" plan, but Taiwan only to certain fragmentary strain policy. (Chua Chunmei, 2005). The current decreasing baby's reality has impended rapidly, here's the way that Taiwan authority should have thought about it.

The Comparison of Educational Administration System

Taiwan Aspect

In Taiwan, the central ministry of education and manager of system organization of Education mainly divide into the Central authorities which is named the Ministry of Education and the County (or city) Bureau of Education.

Japan Aspect

The educational administration system's principle and the characteristic by the constitution, the education fundamental law decided that Japan educational

administration system belongs to the central authority and the place authority cooperation, establishes the central committee and the place two level of management system management systems: The central educational administration organization is the science Ministry of Education, the place education implements by the local public body, the local self-government by said that the government office county and village implement.

Inspiration from the Comparison with Taiwan and Japan

According to the information above, we know that there're similar education systems such as one for the central government and the other for the local bureau.

The Comparison of School System

Taiwan Aspect

The present educational system laid the foundation from the end of the Qing Dynasty, imitated the European land directly, and the US to Republic of China in 1922. It's designed as a six-three-three grades system and mainly divided into Nursery, preschool, primary education: Elementary school, secondary education which is junior high school, the higher education which includes two-grade special training school, five-grade special training school and university. There are Scientific and technical university and technical institute, and the students are offered as the bachelor degree. The adult education includes Open University, university spread education and backflow education includes The Community University which enrolls in supplementary lessons and takes advanced courses the education.

Japan Aspect

The postwar educational reform which establishes "6-3-3-4 system" and it's the same as Taiwan's. It includes preschool education which includes kindergarten; elementary school; secondary education including Junior high school, senior middle school and university including vocational-technical education, junior middle school, high school, each kind of school, specializes in school, the higher college, short-term college. The higher education includes university education ministry, graduate school which is offered master and doctoral degree. The short-term college, specializes in school, the higher college, teacher education special education includes the blind school and maintains the school.

Inspiration from the Comparison with Taiwan and Japan

Taiwan's educational system and Japan's are almost the same because Taiwan's school system is somehow original from Japan.

The Development of the Technical and Vocational Education

In Taiwan the development of technical and vocational education (TVE), takes the US, Japan and Germany's as a main source, but revises the self-criticism, adjusts voluntarily, develops a set education system to suit the national condition the technical and vocation education system.

Japanese technique vocational education goal is to raise student self-control ability, student's professional dedication, and to train the student to be engaged in certain occupation about the skill and ability, the promotion individuality development. The Japanese vocational education mainly is composed of two major parts about the school vocational education and the society in public and in enterprise's professional management. The school vocational education starts mainly from the high school stage in the vocational high schools which include the higher colleges, the short-term colleges, and the specialized schools.

Taiwan Aspect

After Taiwan recovered the lands from Japan's dominion, the high-quality primary vocational school system which the government followed was established by Japan. In 1965, the government set up an experiment on five-year-system vocational school which recruits the elementary school graduation students. In 1968, the government implemented the compulsory education and close down the five-year-system vocational school. The early Taiwan people's vocational skills were taught by the public schools at majority.

Since the starting from 1970s, Taiwan has taken-off very fast in economic development; therefore, it needed the massive basic unit technology talented persons during this period, the manpower development plan was focused on the vocational schools. According to the effect, the high school and the vocational schools student's proportion is 3:7 ratio. Furthermore, the quality and quantity increases rapidly.

But after 2000, since the intermediate stages decrease the school fair and cause much quality reforming to draw together there are more and more high schools but the students are fewer than before due to the low birth rate... At present Taiwan in the technical and vocational system, the Middle schools contain the Vocational school including the industry, business and family-work vocation. The colleges contains mainly five domains such as two-year special school, five-year-special school technical institute, and, scientific and technical university.

The Recovery Phase in 1946-1952

Taiwan planed about the vocational school educational goals and simplifies into three branches such as to adjust each kind of subject and each week teaching hour. The US Education Head Office dispatches an official to come to Taiwan to inspect the vocational education and suggested that the government set up the technical education department in the university to raise the teachers to announce each kind of vocational school curriculum standard and the practice equipment standard, to pick some students

to be free about the government expense or the scholarship to encourage to go study vocational school.

Taiwan Export and Expansionary Phase in 1961-1972

The Taiwan government executed some practical policies such as integrating the third, the fourth, and the fifth issue of economic to construct the skilled manpower, to plan some implements, and to propose some establishment plans about the industry class to branch the policies schedules, and the long-term plan goals to the manpower development. The ways include continuing using the American aid to improve the labor vocational equipment, and implementing the nine-year compulsory education.

Furthermore, the province managed the high school quality and the vocational school, and the government increased the industry regular professional training positively, revised the vocational school curriculum standard, applied to the World Bank loan to renew the labor vocational equipment, impelled to handle each item of cooperative system, introduced the West German pattern to set up an experiment about the multistep teaching, scheduled the Taiwan province private school grant which meant that the prize helps the private school development. In 1966 the government planned the high school to educate the professional branch to pass the scientific general which proportion increased to 4:6 ratio and in 1969 to 1971, increased to 5:5 ratio, subscribed proclaims five-year high vocational school system to set at the tentative method but stopped in 1968. The Ministry of Education additionally built the faculty industry education departments, establish the industrial technology institute; furthermore, the government used American aids to improve the labor vocational equipments, and in this way, it helped a lot for the education system.

Taiwan Export and Expansionary Phase II in 1973-1981

To expand the vocational education, the government built massive numbers of training schools and high schools. The quality in studying the population proportion reached 3:7 ratios in 1981. At the mean time, the government set up Taiwan industrial technology institute, carried out the first issue of labor vocational education improvement plan to promote the skill certificate examination for the students. The vocational schools aggregated education curriculum while grinds subscribes, the promulgation private school law and the rules of procedure, impel to handle each of cooperative system, the revision curriculum standard, the implementation took the vocational campus to comment, increases the professional regular professional training positively, conducts the vocational school student technique competition, continues to set up as an experiment of the multi step teaching.

Internationalization and Liberalization Stage in 1982-1989

The government Implemented the second, and the third issue of labor vocational education improvement plan, promoted the ability of standard teaching experiment positively in accordance to the industrial structure changes, aggregated the education

curriculum and single professional curriculum with parallel. To set up as an experiment the extension by the vocational education compulsory education plan primarily, the faculty above educates by the archery target promotion substitution quantity expands, promotes the information and digital education in accordance to the industrial automation, strengthens technology and the vocational education the weak trend tribal grouping tribal group, continues to handle the technique vocational campus to comment , promotes the school affairs administration computerization work, encourages personal to establish the faculty and the technical institute.

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Taiwan Cross-Century Economic Development Stage in 1997-2000

To remanufacture scientific and technical universities, the government expends the amount of the faculty technology institute, and the technical institute. The plan was set up for the talented persons who wanted to go to the community college. The elastic adjustment and the expansion technique vocational education unimpeded students' further education pipeline. Besides, the coordination industrial upgrading trained the specialized technology talented persons to meet Asian and Pacific transport business center needs and service industry.

As the trend went by, World Trade Organization (WTO) would later increase to be exempt from taking an examination the matriculation plan, would relieve the country Mesozoic academic pressure. The expansion set up as an experiment by the synthesis high school, promoted the technical and vocational education developing.

The reasonable adjustment of technical and vocational curriculum enlarged fine checks against the authoritative text the curriculum, to pour increases the general subject school grades to 40%, will strengthen raises the student basic capability and the occupational ethics, the coordinate already unimpeded technique vocational education enters a higher school the pipeline, the plan technique vocational education system consistent curriculum, strengthens all levels of each kind of technique vocational to teach engagement of the curriculum with to make uniform.

Taiwan Starts and Challenges 2009 Stages in 2001-Nowaday

The expansion handles the synthesis high school, encourages the school establishment characteristic, promotes the student to delay opportunity of the divergence, establishes high school of quality education adjustment technique

vocational education curriculum the suitable development, the strengthened technique vocational campus teachers standard, strengthens the technique vocational education partnership, carries out the technique vocational practice teaching and the professional card illuminates the system, establishes multi-dimensional, complete and educational system of the consistent, the promotion technique vocational multiplication, specialized, the characteristic development perfect university legal system foundation, enhances the university independency; The pursue university develops remarkably, promotion scholarly research standard; The building education internationalization environment, establishes the benignity competitive system, promotes the folk participation positively, adjusts the college education resources reasonably, the plan impetus university study gate comments, construction International University academic comments the target establishment lifelong to study the network, the perfect lifelong education legal system, encourages the public or private organization establishment study organization, promotes all levels of study school coordination to be engaged in the lifelong education reform.

Japan Aspect

In 1951, the Japanese formulate the industry education promotion law, and stipulated that the industrial education is the foundation of developing industry economy and enhancing the national life. By establishing the industrial education it's the work to correct faith, instruction industry technology. At the same time, it raises the ability, and then supports oneself to the economy to make the contribution. Furthermore it encourages the nation and the local public enterprise to develop the vocational-technical education, and stipulates that the country takes the funds subsidy policy in this aspect.

The vocational-technical education holds the status which in Japan's school edition wants very much, trains large quantities of superior technical talented person and the skilled labor force, promotes Japanese economy to develop. Besides the kindergarten and the elementary school, all levels of schools establish the professional technical discipline, carries on the vocational-technical education to the student. The Japanese oneself shape multi-layer, type's education network, has the school. The enterprise and the society manage the number broad heading vocational-technical education, has the vocational education, in office education and career change education.

In 1951, the Japanese formulated the industry education promotion law, stipulated that the industrial education is the counter-development industry economy and enhances the national life foundation; through the industrial education of the establishment to work correctly and faithfully, instructing the industry technology at the same time, it's important to raise the ability, then to support oneself to the economy and to make the contribution. Meanwhile the nation encourages the enterprise to develop the vocational and technical education, and stipulates that the country to take the funds subsidy policy in this aspect.

The technical and vocational education holds an important status in Japan's school to train the large quantities of outstanding technical talented persons and the skilled

labor force, to promote the Japanese economy high speed development. Besides the kindergarten and the elementary school, all levels of schools establish the professional technical discipline, and carries on the vocational-technical education to the students. The Japanese shape multi-level and multi-type's education networks at schools. The enterprises and the society support massive vocational-technical education for the employee such as before-duty education, on-line-job education and career-change education.

“Each kind of school” is a general name of the implementation school edition and not only mainly recruits the high school graduation students, but also recruits other school enrolled student and the public figure. Specializing in the school is the new vocational education organization which started to set up in 1976 is mostly privately established, and is comes by “each kind of school” for the promotion reorganization. To develop rapidly specializes in the school to be possible to divide into three kind of categories, (1) supposes the high school curriculum higher to specialize in the school (the high school standard, may award the graduate the high school graduation qualifications; (2) the recruitment high school graduates set up the specialized courses the college, belongs to the higher education, is specializing in study occupies the main status, may award the graduate the same level qualifications); (3) supposes general specializes in study, but enters a school freely, is model which educates finally.

Carries on the vocational-technical education the school mainly to have the junior middle school, the high school, each kind of school, specializes in the school, higher college and short-term school and short-term college and so on. The junior middle school stage vocational-technical education goal is: Trains the student to have the professional technology base knowledge and the basic skill, the good work manner and will act according to own individuality choice in the future path's ability; The high school and the university stage vocational-technical education's goal is trains the student to have one kind to social mission consciousness, enables it is to act according to own individuality to decide that future path, will enhance the general education standard, will master some professional; In addition, in Japan vocational-technical education, in the enterprise the staff educates has the important position; The enterprise carries on to its staff from the enrollment to the retirement education and training primarily, its content except the special technical education, the skill training, the management education, sharpens the management ability the education, by takes the enterprise staff's quality education and so on.

Japanese Meiji Time in 1868-1912 on World War II

The Meiji 5 years (in 1873) the Ministry of Education promulgated the new educational system, the secondary education including occupation class branches and so on pass course, industry, trade, after becoming the vocational education started Second World War, officially establishes the new school system, in high school splitting pass course and professional branch, coordination to orientation, strengthening technical education.

Japanese Post-War Period - 1951

After Japan defeats, the US dispatches the education diplomatic envoy visit to Japan, inspects Japan by one month-long time study Japan situation to educate. Draft resolution: Enables Japan's educational system to be engaged in the important transformation along the American basic spirit. Such as six - three - three system's introductions, the revision curriculum content and the textbook, suggested that in each, the road, the government office, the county by way of the election establishment Panel of educators, the prewar centralization's educational administration system will transform into US's-like decentralization system. In 1951, the formulation "the industrial education promotion law", stipulated that the industrial education is develops the industrial economy and enhances the national life the foundation.

Japanese Vocational Training Laws and Regulations in 1969-1978

The announcement in 1969 and in 1978 revised the adjustment. Announces the present basic idea: develops worker's professional ability. The vocational training and the professional ability examination must under the coordination implement mutually; to the young people the vocational training should specially in accordance to its individuality. And coordinates its tendency implementation; Implementation to bodily of either the vocational training, should special attention his/her body or the energetic condition, provides the essential aid based on the situation.

Japanese Aspect

In school educational institution: Manages by Ababa scientific province, agricultural college: By farming and forestry province manager, in public vocational training and enterprise vocational training: By work province unification jurisdiction, generally funds: Japan's vocational teaches the organization, divides into state-run, public, the privately established three kinds, has the different funds origin respectively, and formulates has the corresponding funds law, Professional High school state treasury subsidy system. In order to carry out the professional high school expensive equipment establishment funds, implements the state treasury subsidy system, guaranteed that its facility, the equipment reach certain standard.

Japan in 1984-1988

The establishment temporary education review conference (National Council on Education Reform), facilitates lifelong studies (lifelong learning) realizes this committee to propose three educational reform idea: (1) takes individuality behavior, (2) reforming to become lifelong studies the society, the goal is leading the emphasis official education, the value has lost and founds the new educational system, complies with each kind of social change physical demand, expands including the high tech, the software industry, the new knowledge and the technology, (3) in accordance to each vicissitude, internationalization and the modern information media's including the social each stratification plane expansion, and the Ministry of Education set up in 1988

lifelong studies (lifelong learning) the bureau, stressed that lifelong studied the importance and is taken seriously the tendency.

Japan Repairs the Law in 1994

In 1992 raised (1) lifelong studies the strategy report, the revision professional ability development promotion law, mainly included: (1) matter owner and so on implements professional ability of expansionary action, (2) the central committee development and said that the government office county implements professional ability of expansionary action, (3) the central committee development and said vocational training, (4) the matter owner government office county implementation and so on implements the vocational training to recognize, (5) professional ability development comprehensive university school, (6) professional trainer and so on, (7) vocational training legal person, (8) skill examines, (9) professional ability development association, (10)1991 year, changes the quality school the college. And set up as an experiment the comprehensive high school in 1994.

Japan in 1995-1998

In April, 1995 it planned three important topics: Japan the futurological education system, the school, community's role and three between will cooperate contains the research and in office teaches the organization (in-service training institution). Complies with individual ability and the tendency education of adjustment, improves between the school the connection, the coordinate internationalization, expansion of the modern information media, and the science and the technical progress, 319 universities met suitably in 1998 the college education and the achievements in scientific research for the community the resident study the opportunity, in 1999 broadcast (television) the university, the establishment life science, the industrial society, the humanities three big branch departments, 320 curricula gave 73,000 social people.

Japan in 21 Century

Lifelong study (lifelong learning) oneself is the basic state policies and the educational policy.

Certificate Skill Examination

Taiwan Certificate Skill Examination

There are six vocational training centers Taiwan skill training centers from north to south in the Executive Yuan Laborer Committee, first minister of education pointed out that the technique special campus teachers and students work place practice, expands the implementation proportion year by year; The Ministry of Education Technique Vocational Department indicated that recommends by the school 95 to 97 school year this nationality technical college graduates, and must in study the graduate holds the

post of the practice 1 year to the work place, the public assistance every month 22,000 Yuan. Obviously the Ministry of Education also positively takes seriously.

Japanese Certificate Skill Examination

Enriches the well-being of the masses the work province: Employment ability development organization: The employment ability development organization says government office county center 47, prime task: Employment development, ability development, goal: Promotes the laborer to get employed ability, provides the employment consultation and the function appraisal and raises holds public office teaches the news and the pipeline, but is in itself not engaged in manages oneself the training, but entrusts the folk unit to handle; professional ability development assembles university school one, the professional ability development university school, in Taiwan four year system technology institute. The professional ability development short-term college school, is equal to Taiwan's two year system training school; professional ability development promotion center 62, say under the government office county to suppose the professional ability development short-term college school 7 institutes and professional ability development school 201.

The Cooperation between VTE School and Enterprise

Taiwan Aspect

For the promotion after the social development, 61 year in September issued that “the technique master skill examination and sends the card means”, drew up in July, 1973 decides the first skill examination standard “the freezing air conditioning repair skill examination standard”, in 1974 started to handle the skill examination, stopped by 93 year at the end of June, announced that 180 examined the job orientation class, issued after due investigation the technique master to prove 2,800,000, according to the professional training method 34th stipulation: “recommends for employment the technical position personnel to obtain grade B technique master proving, selects according to the vocational school graduation degree uses; Obtains A-grade technique master proving, selects according to the training school graduation degree uses”, the 35th stipulation: “in the technology with the public security related industry enterprise organization, do not should employ technique of master the certain proportion”. Above stipulation, not only had determined the technique master proves value, also improved technical personnel's status. But Taiwan skill examines the e evolution: The national technique master skill examination, the enrolled student skill examination, the special case skill card according to the examination, the special skill operation authentication examination, namely measured that namely comments the discipline examination (94 year launches) namely to measure namely comments namely issues the card.

Japan Aspect

The skill examination is implements by work minister; the central professional

ability development association establishes the test question. Says the government office county professional ability development association: , said that the government office county magistrate implements the skill examination (but cooking and building cleaning exception), and accept the skill examination register application, test services and so on implementation to hand over by said that the government office county professional ability development association is responsible.

Education Trend of Development and Characteristic

Taiwan Aspect

The government constructs the complete multi-dimensional vocational education system study, promotes its achievements, quality and usability. To adjust and promote the later period medium vocational education school is important to elasticize the potency. This area separates the higher technical vocational education and the ordinary universities' localization and function, and counsels the special immovable property study corporative plan. Also it helps reward the teaching characteristic, and the commenting the system, establish the mechanism for some unfit schools to leave the stage completely. Meanwhile it carries out the academic exchanges, and the expanded impetus internationalization.

Japan Aspect

The revision education fundamental law impels the comprehensive sex education leather. The formulation education promotion basic plan, the carrying out state-run big research method, to realize the university independent management, raises has the rich emotion and the robust body and spirit talented person take self-realization as the goal supporting oneself personnel training, raises is rich in the creative knowledge century leader, raises can create the new public spirit, participation by the initiative manner constructs 21 century countries and society's Japanese national, raises has the essential traditional culture knowledge, to enliven in the international society has the education Japanese.

Educational Reformation

Taiwan Aspect

To impetus the technical curriculum reformation, the government reduces the students' loading on expense and curriculum, matriculation system, execute the implementation multi-dimensional matriculation plan to promote the related discipline merge, to use effective promotes the resources, to implement ate the synthesis high school, to probe the student tendency, to encourage the training school reforming promotion technology institute or the branch university, and to strengthen the competition resources.

Japan Aspect

By increasing the funds budget, the government expands the equipment and the teachers, to promote education personalization, to diverse and to melt the electrification, to take the competition at markets, to educate the students on liberalization views, to emphasize the education remarkably and efficiently. In these ways, it offers valuable and user-friendly education environment, the government establishes lifelong system, strengthens the internationalization, and promotes the information education overall quality.

Inspiration from the Comparison with Taiwan and Japan

Taiwan and Japan face similarly the situations which should make the vocational school aspect freely, melts democratically. We must try to make the culture technique professionally to coordinate the country after the construction demand, make it come true for simplifying the subjects.

Conclusions and Suggestions

Conclusions

In Taiwan, the technical and vocational education's development takes the US, Japan and Germany technical and vocational educations as the main sources, but revises, self-criticizes, adjusts voluntarily, develops a set education system to suit the national condition, and evolution.

Japanese education system construction is complete and the education curriculum makes the consistence. The curriculum projects use the simplification and entire which make the united strategies around the country, and coordinate the time industry. The Japanese education addition related science and technology curriculum to be worth us profiting by observing others.

There are only kinds of the Japanese professional category, but in Taiwan there still are more than ten kinds of study groups at present; therefore the Japanese education system firmly match the economic development, the industrial demand and the tendency may supply the reference.

In the view of the industrial field aspect, we should suitably and positively to take the produces study by cooperation, provide explicitly to produce the cooperation direction. Many talented persons with the educational world enter this field to hand over and to construct the attention about the correlation technique.

The Industrial and Enterprise Field Aspect

We should use the suitable and positive produces to connect the cooperation among the vocational schools, industry and enterprise to provide explicitly production direction.

The Government Aspect

The government should grasp the law suitably to encourage the business community positive with completing suitable produces study as the bilateral bridge to strengthen the produces study conformity of the cooperation coherent units.

Academic Field Aspect

Make the suitable initiative to pursue the cooperative enterprise positively, encourage and inspire the means of the cooperation, manage positively suitable produces study about the cooperative effort publication meeting, and make the curriculum plans for the suitable consideration enterprise demands.

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Accreditation of Technical Education and Vocational Training in Nepal and South Asian Countries

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ABSTRACT Technical Education and Vocational Training (TEVT) is the powerful means to improve the quality of life, weapon against poverty and intolerance, therefore, maintaining its quality is of paramount importance. The increasing mobility of the workforce, internationalization of curricula, transnational delivery of programs, electronic delivery modes and credit transfer has posed an overriding challenge for TEVT. This article explores about the accreditation as a tools for these challenges. Accreditation and certification is often considered a step towards establishing a culture of quality – sustained and maintained by defining objectives, developing capacity to achieve them and evaluating whether they are achieved or not. Nepal is in primary stage of implementation. Different countries, many schemes of accreditation and certification have been set up by various agencies or organizations. They function in different approaches: institutional, program, or both; voluntary or prescribed mode; national or regional scope; and peer or external evaluation.

KEY WORDS accreditation, technical education and vocational training, Nepal, South Asia

Introduction

Technical Education and Vocational Training

Technical Education and Vocational Training (TEVT) is an integral part of the education. Its orientation towards the world of work and the acquisition of skills plays an essential role in promoting a country's economic growth and contributing to poverty reduction; ensuring the social and economical inclusion of marginalized communities. TEVT helps learners acquire skills, knowledge and attitudes needed to develop professional careers and enter the world of work as well as active citizenship and lifelong learning. Throughout the course of history, various terms have been used to describe elements of the field that are now conceived as comprising TEVT. These

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include: Apprenticeship Training, Vocational Education, Technical Education, Technical-Vocational Education (TVE), Occupational Education (OE), Vocational Education and Training (VET), Professional and Vocational Education (PVE), Career and Technical Education (CTE), Workforce Education (WE), etc. Several of these terms are commonly used in specific geographic areas.

Generally, TEVT is provided by secondary schools, junior colleges, polytechnics as well as vocational training institutes. All of these are being run by public or private agencies. TEVT courses ranged from various fields and are grouped into: engineering and technical, agriculture and forestry, fishery and maritime (sea, ocean, sailors, sailing) health and nursing, business and commerce, service and domestic areas. Some have well-defined occupational knowledge and skills standards while others do not have. TEVT systems must also be open and all inclusive to give even the most underprivileged access to learning and training (UNESCO & ILO, 2002). In Nepal public and private technical schools including vocational training centers under the CTEVT are providing basic and middle level TEVT courses.

Education should enhance opportunity for mobility within an occupation and adaptability of individuals to changing conditions in the world of work. Technical education, specially must meet the individual's educational requirements which may be less than a college degree but necessary to his/her for employment or promotion. This paper, first of all, discusses the theoretical aspects of the accreditation and its implementation in south Asian region. The main purpose of this article is to promote the value of accreditation in technical education and vocational training and share practical experience of Nepal. This article is based on the literature review, information of the text and author's personal experiences and observation regarding accreditation of technical education and vocational training in Nepal.

Movement of Student and Workforce

There is a growing demand for recognition of TEVT institutional qualifications to transfer of credit, mobilize faculty, students and educators across borders. This is due to a number of factors, such as increasing economic globalization, significant migration flows, the increasing international labor market opportunities for the highly skilled, and the growth in international trade in services. Issues related to the recognition of professional qualifications are increasingly covered in trade arrangements. In addition, employers are concerned about the need to understand and recognize the competencies of technical workforce in a globalize world. Qualifications should be practically recognized according to job requirements. It is noted that technological change is a major source of economic growth and development as evidenced by the progress attained by Japan and the newly industrialized countries in Asia such as South Korea, Malaysia and Indonesia. These developments have also precipitated a significant transformation, leading to increased requirements of scientific and technological knowledge and skills at work.

Nearly all of the population growth in the next 30 years is expected to concentrate in urban areas of less developed regions. Statistics shows that international migration

continues to exhibit an upward trend where about 140 million people now live outside their countries of birth. In Nepal 4% of the total population are working outside the countries. Moving into the global economy raises the standards for goods and services that suppliers have to meet. These higher standards prevail within the suppliers domestic markets as well as across national boundaries and in the end affect the educational system. The present labor market calls not only for employable skills but also for flexibility to adjust, and preparedness to change jobs more than once in a lifetime. The new employee must possess core competencies to equip him/her to adapt rapidly changing nature of work in informal economy. TEVT is one of the avenues where one acquires flexible skills and knowledge to make the transition from education to work and increase their employability in the changing economy.

Quality of Education and Training

In an age of accountability, the quality of program offerings must be of paramount interest to all stakeholder including technical and vocational educators. In the present context of economic liberalization and open market system, importance of quality of training is even greater. Only the graduates of those institutions that maintain the quality and standard of training will have better chance of getting high wage employment. How best to address the question of quality and help institutions to improve through a systematic process of evaluation is the major concern of TEVT. For the process of TEVT training standards can be organized into three major sections: resource standard, process standard, and performance standard (Dhungel, 2001). It is evident that accreditation is a process that plays an important role in maintaining educational quality.

Technical education and vocational training is a decisive factor in development. It is therefore, necessary for technical education to undertake periodic review of the curriculum and subject content of the technical programs to ensure that they are up to date not outmoded or obsolete and effectively fulfill the technological requirements of the country. The pursuit of quality is a continuous cycle which involves the development of standards, quality audit, quality assessment, quality assurance, quality improvement and accreditation. The institutions are expected to provide quality education and perform their roles effectively in producing qualified graduates who will meet the needs and expectations of society. Each institution is required to develop its own mechanism to ensure quality; this is sometimes called quality assurance. Consumers should be in control of service quality - that is, individual consumers making choices in the market place guided by private accreditors.

Quality assurance (QA) is one of the mechanisms developed by educational institutions to ensure that graduates attain adequate standards of education and training. It may consist of internal and external QA. Internal QA refers to the audit and assessment done by a team from within the organization. External QA refers to the audit and assessment done by a team from outside the organization, with the purpose of making the evaluation more objective. The school must review the results and improve the quality in areas that are not yet at the highest level, while maintaining the quality of those that already meet the standards.

Scope of Accreditation

Accreditation

Accreditation is one of the primary methods for maintaining standards of education. It is considered as a quality assurance measure and as a useful management tool for continuous improvement. Accreditation is a system for recognizing education and training institutions and professional programs affiliated with those institutions for a level of performance, integrity and quality which entitles them to the confidence of the educational community and the public they serve. It is a process whereby a professional organization or non-governmental agency grants recognition to an educational institution for demonstrated ability in a special area of practice or training. The accrediting process requires institutions and programs to examine their own goals, operations, and achievements, followed by the expert criticism and suggestions of an evaluation team and later by the recommendations of the accrediting body. Since accreditation is reviewed periodically, institutions are encouraged toward continued self-study and improvement.

Accreditation can be defined as the act whereby the state adopts and makes public the recognition that peers have accorded to the validation an institution has made of the quality of its own academic programs, organization and operating procedures, and how it discharges its social function (ETF, 1999). Accreditation is a formal professional review system in which an organization responsible for quality control grants approval of educational institution. Using evaluation criteria developed by the accrediting agency, teams of outside educators were sent to review self-study reports of member institutions and make their own observation. Recommendations from the team determined member institution's status. Unlike evaluation that concentrate on outcomes of education and training, accreditation movement concentrated on resources and processes used in education and training. Accrediting agencies guidelines and criteria were more focused to monitor the adequacy of facilities, qualification of staff and appropriateness of program design rather than assessing educational status of graduates.

As accreditation systems have matured, they have taken on commonalties that extend to the accreditation of most primary, secondary, and professional schools. The common features of contemporary accreditation as stated by Scriven (1984) include (a) published standards; (b) a self-study by the institution; (c) a team of external assessors; (d) a site visit; (e) a site-team report on the institution; (f) a review of report by some distinguished panel; and (g) a final report and accreditation decision by the accrediting body. Accreditation cannot guarantee the quality of individual graduates or of individual courses within an institution or program but can give reasonable assurance of the content and quality of education/training offered. The performance of the TEVT institutions can be evaluated in socio-economic context of the institutions, nature of student and resource inputs in the institution, utilization of available resources in process of teaching and learning, and nature and quality of the pass out.

Accreditation is a certification of the academic quality of an institution. Will it be voluntary or mandatory as a matter of government policy? Some countries have

independent/private organizations that oversee the educational accreditation process, while other countries accredit through a government agency. Some countries require accreditation and others consider it voluntary. Most of the countries have centralized ministries of education with the responsibility and authority for establishing standards and controlling quality. In some Countries, professional Councils or organizations accredit education and training institutions or programs. The Philippines, United States of America and United Kingdom have voluntary accreditation while Nepal and Thailand have state-prescribed accreditation. In the United States, non-governmental accreditation processes have been developed for several years. Institutions as free enterprises are free to function with or without accreditation in the US. However, institutions using government grants are mandated to produce accreditation report while applying for government grants. In Nepal, responsibility of accrediting Technical Education and Vocational Training program lies on the Council for Technical Education and Vocational Training (CTEVT) and other relevant professional Councils.

It is expected that accreditation serves the purpose of providing confidence to the end users that they are in fact competent. Independence is an important factor in increasing confidence as it helps to eliminate the presence or appearance of an impartial or biased assessment which would compromise confidence. Will accreditation be a government or private sector undertaking? Also, in the engagement of accreditors/auditors, will it be peer evaluation, or will it engage expert services? A mix of peer or expert services is a common practice world-wide.

Purpose, Assumptions and Types of Accreditation

The purpose of accreditation is to improve the quality of education and training by ensuring that the institution is meeting certain standards. Accreditation is basically guided by the principles of quality standards and provides opportunities for TVET institutions for continuous development through self-evaluation. Based on the literature in accreditation (Sharma, 2001) following six goals of accreditation are identified:

- To foster excellence in TEVT through development of criteria and guidelines for assessing educational effectiveness.
- To encourage improvement of institutions and programs through continuous self-study and planning.
- To ensure organizations and agencies, the educational community and general public that an institution or particular program has both clearly defined and appropriate objectives, maintains condition under which their achievement can reasonably be expected, appears in fact to accomplishing them substantially, and can be expected to continue to do so.
- To provide counsel and assistance to establishing and developing institutions and programs.
- To encourage the diversity of TEVT and allow institutions to achieve their particular objectives and goals.
- To endeavor to protect institutions against encroachments that might jeopardize their educational effectiveness or institutional freedom.

Table1
Assumptions and Benefits of Accreditation

Assumptions of Accreditation	Benefit of Accreditation
a)The scarce resources should not be wasted through duplicated, redundant or obsolete training.	a)Helps the institution to know its strengths, weaknesses and opportunities through an informed review process.
b)TEVT must be closely tied to the development needs of a country and employment needs of its people.	b)Gives institutions a new sense of direction and identity to identify internal areas of planning and resource allocation. Enhances collegiality on the campus.
c)The general public and employers must be ensured of high quality and ethical training delivered by institutions so that graduates will have a realistic chance of employment upon successful completion.	c)Outcome provides funding agencies objective data for performance funding. Initiates institutions into innovative and modern methods of pedagogy.
d)Accredited training programs provide individuals with maximum possibility for equivalency credit when moving between institutions or seeking certification and or licenser.	d)Provides society with reliable information on quality of education offered. Employers have access to information on the quality of education offered to potential recruiters.
	e)Promotes intra and inter-institutional interactions.

Educational accreditation can be classified into two types, one as institutional and the other, as specialized or program accreditation. Institutional accreditation normally applies to evaluation of the entire institution as a total operating unit. Specialized/program accreditation normally refers to evaluation of programs, departments, units or schools, which usually are parts of a total college or university system.

Status of TEVT Accreditation in Asia Pacific

Asia Pacific Accreditation and Certification Commission (APACC)

With the support and commitment of 16 member countries the inter-governmental international organization Colombo Plan Staff College for Technician Education for Human Resources Development established the Asia Pacific Accreditation and Certification Commission (APACC). The commission aims to accredit and certify the TEVT institutions for human resources development through the standardization and harmonization of education and training systems which will facilitate the mobility of the workforce across national borders in Asia and the Pacific regions. APACC will ensure that it is able to guide Technical and Vocational Education and Training (TVET) institutions in equipping themselves with internationally-recognized standards and systems.

APACC member countries entered into the voluntary Memorandum of Agreement (MOA) with APACC concerning mutual support to advance the core principles of accreditation and certification of technical and vocational education and training (TVET) systems for human resource development (HRD) in Asia and the Pacific Region.

Table2

List of the Countries and Organizations Sign MOA with APACC

No.	Country	Organization Sign MOA
1	Bangladesh	Directorate of Technical Education (DTE), Ministry of Education
2	Bhutan	Department of Occupational Standard, Ministry of Labor and Human Resources
3	Fiji	Ministry of Education
4	Indonesia	Directorate of Technical and Vocational education (DTVT), Ministry of National Education
5	Korea	Human Resources Development Service of Korea (HRD Korea)
6	Maldives	Maldives Accreditation Board (MAB)
7	Mongolia	Mongolia National Council for Education Accreditation (MNCEA)
8	Myanmar	Department of Technical Vocational Education (DTVE), Ministry of Science and Technology
9	Nepal	Council for Technical Education and Vocational training (CTEVT)
10	Pakistan	National Vocational and Technical Education Commission (NAVTEC)
11	Papua New Guinea	Department of Education
12	Philippines	Technical Education and Skills Development Authority (TESDA)
13	Sri Lanka	Tertiary and Vocational Education Commission (TVEC)

Source: APACC (www.apacc4hrd.org/moa)

In the APACC scheme, institutional accreditation is preferred, covering accreditation and certification of TVET institutions of higher technical and non-degree technical education, and vocational training in Asia and the Pacific region. The APACC with the objective to harmonize and standardize skills taught in TVET institutions, will continuously strive to strengthen the human resources in the Asia Pacific region. It is intended to strengthen the working relationship among APACC accreditors and quality assurance agencies in member countries and encourage and enhance ongoing cooperation and communication. Lack of transparency and comparability in skill testing and certification arrangement hampers effective cooperation in skill formation. There is an urgent need to develop a accreditation and certification framework with the ultimate goal to facilitate the mobility of educated workforce among the countries of the world.

Thailand

In Thailand there is an Office for National Education Standards and Quality Assessment, which is an independent body created by the 1999 Education Act and Royal Decree to set objective standards and key performance indicators and conduct external quality assessment of educational institutions at all levels. The Department of Vocational Education (DOVE) under the MOE is responsible for administering formal secondary-level and post-secondary-level vocational and technical education. The DOVE has operated an evaluation system to improve the quality of TEVT. Recently the Department of Skills Development (DSD) has been operating a similar evaluation system to ensure higher standards.

India

The National Board of Accreditation (NBA), India was established by AICTE (All India Council of Technical Education) as an autonomous body. It is the only authorized body in India entrusted with the task of undertaking accreditation of technical education programs. NBA is charged with the task of evolving a procedure for quality assessment in TEVT sector and specially to articulate the criteria for assessment of quality, identify parameters to quantitatively assess these criteria and assign appropriate program-specific weightages for each, validate the procedure by well-designed test runs and to establish appropriate benchmarks. The NBA has already developed the necessary infrastructure for initiating the process of accreditation by formulating policy initiatives for under graduate and post graduate programs not only in engineering and technology, but also in related areas like Architecture, Town Planning, Pharmacy, Technician Education and Management studies.

Sri Lanka

The Tertiary and Vocational Education Commission (TVEC) is the apex body in the technical and vocational education and training sector in Sri Lanka. The primary responsibility of the TVEC is policy formulation, planning, quality assurance, coordination and development of tertiary and vocational education across the country. The TVEC completes assessments for registration of vocational training institutions and for accreditation of vocational training courses; which is required by all institutions offering vocational training courses to government recognized standards. The TVEC is responsible to monitor the maintenance of quality and standards at registered and accredited institutions. All institutions providing vocational training courses must be registered with the TVEC and acquire accreditation of individual training courses in order to conduct nationally recognized vocational training and provide National Vocational Qualification (NVQ) certificates

Pakistan

The government of Pakistan has established the National Vocational and Technical Education Commission (NAVTEC). The Commission is mandated to facilitate, regulate, and provide policy direction for technical education and vocational training (TEVT) to meet national and international demand for skilled manpower. The Commission reviews, devises policy and evolves strategy/prepare training programs relating to human resource development with a focus on technical and education and training. The NAVTEC's is also dedicated to develop national occupational skills standards, curricula and trade testing certification systems for all sectors in which TEVT is imparted. In conjunction with the provincial counterpart Technical Education and Vocational Training Authorities (TEVTAs), it would undertake national planning, curriculum development, standardization of technical education, training of trainers, national accreditation of private polytechnics and institutes and develop strong linkages with the industrial end users.

China

In China the Academic Degrees Committee of State council (ADCSC), a governmental organization which is in Ministry of Education is in charge of degrees and postgraduate education. Those who meet the requirements set by the ADCSC would be accredited and approved to provide professional degree programs. Institutional accreditation of newly established higher vocational education institutions is the responsibility of the provincial government. According to government regulation (Office of the State Council, 2000), the provincial government should set up accreditation agencies to conduct evaluation work concerning establishment of new higher vocational education institutions. The new institutions which meet the requirements set by the government could be approved and registered in the Ministry of Education's list of accredited higher vocational education institutions. The Ministry of Education is responsible for publishing Guiding Catalogue of Higher Vocational Education Programs as a basic government document regulating the setting up and restructuring of study programs in higher vocational education institutions and other institutions offering higher vocational education courses. The provincial education authorities are responsible for the validation and approval of higher vocational study programs, which are subject to the final registration of the Ministry of Education (Wang, 2008).

TEVT Accreditation in Nepal

TEVT in Nepal

There are numerous institutions and organizations involved in TEVT sub-sector in Nepal. The major organizations are the CTEVT, Ministry of Labor (MOL), Cottage and Small Industry Development Board (CSIDB), Department of Cottage and Small Industry (DCSI), National Academy for Tourism and Hotel Management (NATHM, the then HMTTC), Illam Kendra FNCCI, National Electricity Authority (NEA) and Ministry of Local Development (MLD). The purpose of TEVT sub-sector program is to facilitate the growth and development of human resources of the nation.

Until the beginning of 1990s, training was perceived as only the responsibility of government. This included the technical schools as well as vocational training and outreach programs. However, after the restoration of democracy the private sector emerged as an important TEVT partner. Due to diversity in rapidly growing institutions, standardization and quality control of private training institutions, operating with a strong profit motive, have been even more challenging. The general public as well as other TEVT stakeholders have continuously questioning their quality, relevancy and effectiveness. Therefore, a great amount of effort is required to maintain the quality of the existing program by accreditation.

Council for Technical Education and Vocational Training (CTEVT)

The Council for Technical Education and Vocational Training (CTEVT) is an apex body of TEVT in Nepal. It was established by Technical Education and Vocational Training Council Act, 1989 and amended in 1993 and 2006. The act declares that the CTEVT is established for the purpose of regulating and upgrading the standard of TEVT, maintaining co-ordination among different agencies imparting TEVT, determining and certifying the standard of skills and produce basic, middle and upper level technical manpower. The amended TEVT Act of 1993 has given the huge responsibility of setting the training standards, accrediting and certifying the training institutions, developing curriculum for training courses, conducting research activities and coordinating the other TEVT partners. The CTEVT serves the country through technical schools, polytechnic and rural training centers. It has been managing one technical institute for technical instruction (TITI), 18 technical schools including polytechnic and rural training centers and more than 250 affiliated institutions. (Basnet; Eun & Kim, 2009). Total enrollment capacity of these institutes is about 12000. Private institutes offer training mainly in agriculture, engineering, health, electronics, food technology, etc. Level of training courses can be categorized into 3 broad classes, short course training, technical school leaving certificate (TSLC) and Diploma.

The CTEVT started the annex Program in 2002 in collaboration with the Department of Education. This is technical education program being offered within the premise of general secondary schools sharing the part of the physical facilities and human resources including the management. It is operated through local initiatives of the school and community under the cost sharing mechanism between the government and the local community. Currently 15 schools are being conducted with partly financial support from the CTEVT and 5 are being conducted through self-finance (UNESCO, 2006).

Under the public/private partnership scheme Nepal Government/CTEVT and the Federation of Nepal Chamber of Commerce and Industry (FNCCI) have joined hands to develop 9 Illam Kendras to provide employment-oriented marketable skills. The FNCCI is taking lead role in developing such Kendras in previously planned 9 locations around the country. Currently, five Illam Kendras are in operation and other are in the development stage.

Accreditation in Nepal

The CTEVT is responsible for accreditation of TEVT institutions by act and similarly professional councils are responsible for their respective programs in Nepal. As the statutory authority, Health Professional Council and Nursing Council's Act set out conditions for the registration or licensing to practice. The Act prohibits any health professionals to practice his/her profession without being registered with their related councils. The next important functions of professional councils are to prepare "Minimum Requirement for Recognition of the Education Programs" in the country. The institution that meets the "Minimum Requirements" set up by the related council will be awarded with an accreditation certificate. The CTEVT has also prepared

"Minimum Requirements for the Affiliation of Programs" The institution, which meets the "Minimum Requirements" set up by the CTEVT will be affiliated and accredited.

The CTEVT works with professional organization and industry to assure the quality of trainees emerging from recognized training centers. It is done through development of appropriate curricula, testing and certification procedures and involving in affiliation procedure. The CTEVT grants accreditation and affiliation to the private institutions. It also provides equivalency to the people studied/trained in abroad in the related field. The process of affiliation of the training providers is as follows:

- a) Inviting the proposal for establishing the training institution. The propose institute submits a request form with details proposal only after the formal notice of the CTEVT. The proposal must be comprehensive and clearly shown the provision of given components.
- b) Selection of the proposals based on developed criteria. The initial documentation and proposal are evaluated and selected by an advisory committee appointed by council and comprising: Vice-Chairperson of the CTEVT, Member Secretary of the CTEVT, Representative from related professional Councils, Director of Accreditation division, Representative from subject related Ministry, Representative from the Ministry of Education, and Representative from concerning university.
- c) After selecting the proposals, a verification study of the selected proposals is carried out. The advisory committee normally conducts the verification study. The visit will normally extend over few days, and will focus on the verification of documents, needs assessment, exposure to professional practice etc. The verification teams includes the representatives from professional council, related ministries, universities and the CTEVT. As soon as possible after study, normally within few days a report to the council is submitted with recommendations by team.
- d) The report and recommendations are finalized. On the basis of the report and recommendations for each program evaluated by council and may decide to give letter of intent for the development of the infrastructures and teaching learning facilities.
- e) Institution which meets the "Minimum Requirements" prescribed by the CTEVT will be visited by team and inspect physical as well as teaching facilities including tools, equipment and furniture. The report and recommendations including comments of team are submitted to the council.
- f) The CTEVT Council evaluates report and may decide to give affiliation to the program and institution that meet the minimum requirements.

CTEVT Guidelines and Standards

The CTEVT establishes a set of guidelines and standards to measure performance of TEVT institution/program. The guideline and standards serve the institution in determining item by which the accreditation committee will base its findings following the initial evaluation. The following are the most common topics included in the standards for accrediting training institutions/programs.

a) Philosophy, goals, purpose and objectives of the institution/program

The philosophy of the education institution should be a statement which expresses the beliefs, concepts and attitudes of the school as to why it was established and continues to operate. The purpose of the technical and vocational education institution should be to instruct men and women to such levels as to qualify them for employment and/or advancement in existing or potential occupations. The statement of purpose must be clear and concise and shall represent the official concept of the institution. Each institution shall clearly define the educational services it provides. Each institutions should have an appropriate publication which reflects accurately the institution's statement of philosophy and purpose and the means through which this is to be achieved.

b) Organization, administration and governance

The institution must have a properly constituted governing body which has legal responsibility for the school's operation. Board members should have experience, ability, and dedication to the philosophy and purposes of technical vocational education. The administration should be composed of the chief administrative officer and personnel needed to perform all duties required for the efficient operation of the institution. The organizational structure of the institution must reflect that its purpose is to facilitate the instructional process.

c) Long-term planning

The institution must have a long-term plan for developing new programs and for phasing out those which are not meeting the needs of the service area. This plan must include demographic studies, occupational surveys', curriculum development, cost estimates, potential enrollment figures including disadvantaged and handicapped, facility and equipment needs, and instructor availability. The plan also must identify the source of sufficient funds so that existing programs will not be jeopardized.

d) Training program and instruction

A statement of purpose for each specific technical/vocational program must be developed and reevaluated annually as a means of updating instructional offerings and as a measurement of the institution's contribution to the individual, the business or industrial community, and to society. Fundamental to any educational

program must be: a clear definition of objectives; admission policies which reflect the philosophy of the institution and insure the student a reasonable expectation of success; and an ongoing program of evaluation and assessment. The objectives and content must be correlated with the current business and industrial needs.

Admission – Admission to the educational program should be determined by written policies and rules of the governing board(s) and the institution offering the programs.

Programs – A publication which accurately explains the programs offered in the institution should be publically available. This publication should be designed to assist the prospective student in planning his/her program. A process must be established for continuous evaluation and updating of all programs.

Instruction – The instructional programs must be organized to provide the knowledge and skills development that are essential for success in the occupation. Within the classrooms, shops and laboratories; there must be evidence that instruction has been properly organized and is being implemented through multimedia approaches. Records showing the progress of the individual student must be maintained and made a part of his permanent file. There must be a system of evaluating student achievement.

e) Staff

Selecting, developing, and retaining a staff which is competent to meet the purposes of the institution is of utmost importance to the success of the institution. There must be a published salary schedule. There should be clear channels of communication between administration and staff which will allow for effective interchange of ideas and information. To have a continuity of educational excellence, each staff member must be evaluated as to performance and effectiveness.

f) Student and student services

Student personnel services are to maintain orientation programs, keep a suitable system of personal records, maintain programs of student activities, health services, and financial assistance. An adequate program of student personnel services must include an evaluative process whereby the effectiveness of the program can be ascertained, particularly in relation to student placement in remedial and on-the-job programs.

g) Library (Learning Resource Center) and media services

Library/learning resource center(s) must be provided by the institution. This requirement may be met in any one or any combination of the following ways: (1) within the individual classrooms, (2) within the individual laboratories, (3) within individual shops, or (4) in a school wide learning resource center. Provision must be made in the budget for supplies, maintenance, and repair of equipment.

h) Equipments and materials

Proper equipment and adequate instructional and non-instructional supplies must be made available to support the instructional programs offered by an institution. Funds must be budgeted to provide equipment and supplies in accordance with acceptable standards and at a level to assure quality occupational education. To assure the success of new programs, planning should reflect that proper equipment will support the instructional program in such a manner that skills development can be achieved.

i) Physical facilities

Physical facilities should be designed and arranged to contribute to the achievement of the institution's purposes. The campus should be of sufficient size to permit orderly growth and expansion over a period of time. Special consideration should be given to meeting the needs of handicapped individuals. The institution shall provide adequate light, heat and ventilation in all areas of the facility with particular attention to conditions which might adversely affect health and safety. A plan for operation and maintenance should be developed and used by the institution.

j) Financial resources

An institution must exercise proper management, financial controls, and business practices for continued operation and financial commitment. In addition to these stated principles, an institution must consider its financial resources as a basis for immediate and long-range planning. Care should be exercised in long-term planning to assure a reasonable and realistic tie to projected financial resources.

k) Placement and follow-up

A systematic program of placement and follow-up is necessary to fulfill a major objective of technical/vocational education. Educational institutions are obligated to provide placement assistance to individuals completing or terminating a program of study and to gather data in an effort to improve each program of study. The institution should provide placement services to all students. These services must be described in a written plan which is in operation.

l) Community relations

One person in the institution should be responsible for the effort, and all others must know what is expected of them. The public information program should include the use of radio, television, and newspapers. Other media including brochures, student newspapers, alumni bulletins, yearbooks, and other school publications should be widely distributed throughout the community.

Performance indicators and assessment tools were developed based on these standards. The CTEVT is facing many challenges during the accreditation process:

human capacity building, institutional capacity building, resources, involvement and commitment, diversity with a common framework and a system of incentives and awards. Accreditation process increase regular costs. Most concern, however, was about the control that the CTEVT would exercise over the process and ethical conflicts for institutions who would become increasingly responsible to the owner rather than to the students. Furthermore, those individuals involved in the development process and in running the Accreditation agenda obtained access to the financial rewards on offer and the opportunity to exercise the authority that they so fervently craved. It is important to realize that the existing accreditation process has nothing to do with market accreditation. Although there are two councils providing accreditation they are essentially not in competition since they use the same set of standards produced by the monopoly supplier of those standards.

Conclusions

As TEVT needs to be responsive to challenges posed by global trends, so does its accreditation and certification system. The challenges arising from global trends made this a timely moment for accreditation to be re-examined and re-adjusted - its standards and criteria, evaluation techniques, and all its operational aspects in order to exact true measurement of quality and excellence. An emphasis on local program improvement should remain the guiding principle of accreditation system. Too much emphasis on meeting the government requirements or requirements laid by the national accrediting body can contribute to a sense of burden; the institutions feel that they participate in the accreditation process because they have to. Similarly, too great an emphasis on providing information to external audiences can shift attention away from the place where learning is taking place. Therefore, there need to be a careful balance between the mandate for accreditation beyond the classroom and it should be focused on local institution improvement efforts.

Another advantage of using the institution as the unit of assessment is its usefulness and relevance to the major stakeholder, such as the government, which provide the funds, the students, employers, aid-granting institutions, donors and foundations, etc.

The Accreditation process turned on its head the view that in a competitive economy, under the rule of law, income is earned by using oneself, or the resources under one's command, in a way that one's customers consider useful to them. Now, individuals and their resources are used in a manner that a third party decides other people ought to consider useful. Accreditation is not only recognition of qualify but it also promotes quality. Accreditation and certification body harmonizes technical education and vocational training systems and facilitating the mobility of workforce across borders.

Since judgements about quality TEVT are so complex, they can not depend on single individual's perception. Though a cooperative team process, a rich set of information is assembled, identifying the strength, weaknesses and opportunities. This information provides the basis for a program that not only ensures all TEVT providers

meet certain standard but also ensures that TEVT providers continue to strive for excellence.

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Empirical Research on the Vocational Ethics Development of Vocational Institution Students in China

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ABSTRACT Vocational ethics education is an important part of vocational education. Within the framework of Sino-German cooperation research program, the paper offers a large-scale diagnostic analysis on the development of the vocational ethics of vocational institution students in China. The research found that students of China's vocational institutions are unable to differentiate vocational identity from work ethics, vocational commitment from organizational commitment; and the commitment and vocational ethics of students of different schools/colleges and specialities have significant difference, which is directly related to the specialty setup and the work organisation of enterprises. The approach adopted in the thesis provides a new view for the development of vocational education research and vocational education management.

KEY WORDS vocational ethics, vocational identity, commitment, large-scale diagnosis.

Research Context

What the society requires from practitioners are not only their knowledge and skills, but also their vocational ethics. As revealed by a survey, enterprises have even higher demands for vocational ethics than that for knowledge and skills from employees, and vocational ethics of graduates is the very problem about which they complain most (China Education Association of Chemical Industry, 2007). However, neither educational institutions nor students are fully aware of this problem. Chinese government has always stressed the importance of vocational ethics education. For example, the newly issued Guidelines for China's Medium- and Long-term Educational Reform and Development specifies that "emphasis should be placed on fostering students' vocational ethics" (MoE, 2010). However, how effective has the vocational ethics education been carried out in vocational institutions (schools and colleges)? How well has students' vocational ethics developed? All this information is not only of great

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importance to the formulation of corresponding policies by related administrative departments, but also of reference value for the curriculum reform and teaching evaluation of vocational education, as well as for the recruitment of enterprises.

An analysis of documents reveals that, China's relevant researches to date have usually proceeded from phenomena to analyze causes and give improvement suggestions; and there hardly has been any quantitative research on vocational ethics. Even if there have been some questionnaire surveys, the content is usually too simple with mainly proportions of various options. It would be of great significance to the development of vocational education if we could obtain data about the status of vocational ethics education through exact psychological measurement instruments, and describe, evaluate, and rate students' vocational ethics. As a fruit of diagnostic researches on vocational ethics of vocational institution students within the framework of *Messen beruflicher Kompetenzen* (vocational competence measurement), this paper, by formulating and improving relevant scales, has examined the individual variables and school variables that have a bearing on vocational ethics and provided corresponding suggestions (Rauner, 2009; Rauner, Zhao & Ji, 2010).

Concepts Associated with Vocational Ethics

As a multidisciplinary, comprehensive concept involving philosophy, sociology, pedagogy, ethics, and so on, vocational ethics is complicated, and liable to different interpretations by people with different cultural backgrounds and social conditions. In China, for example, we usually consider it as "specific behavioral norms that people engaged in a certain vocation must abide by in their work" (Lv, 2003). This understanding stresses the restraining and normalizing functions of vocational ethics for practitioners, and emphasizes the objectivity and externality of vocational ethics. Whereas, people in western countries pay more attention to the subjectivity and internality of vocational ethics. For example, according to Miller's definition, "the term work ethic refers to the beliefs, values, and principles that guide the way individuals interpret and act upon their job rights and responsibilities within the work context at any given time" (Miller, 1986). Guidelines on the Building of Citizen Morality (ZF[2001] No. 15) of the Central Committee of the Chinese Communist Party asserts that vocational ethics is "the relationship between practitioners and clients, vocations and employees, and between different vocations". Some researches divide vocational ethics into subjective aspect (including moral consciousness and moral rules) and objective aspect (moral practices) (Wei, 1995), or eight criterion, such as the obligations, rights, responsibilities, and disciplines related to a vocation (Ministry of Human Resources and Social Security, 2009). The only structure model of vocational ethics in China that is retrieved divides it into three levels: vocational cognition, vocational sentiment, and vocational mission (Wang, 2005). None of the above researches have given any empirical data to support the establishment of a measuring model meeting quantitative research requirements, so we need the support of research results from international

related areas.

This paper argues that vocational ethics is the behavioral intention of an individual to comply with vocational norms and rules of conduct, as well as the positive attitude towards a vocation and values formed through the process of internalization, on the basis of identifying with the vocation (Cui, 2009). There are some independent and yet closely associated concepts, such as vocational identity, vocational commitment, and work ethics, which are very important in relevant international research fields. This research is based on a model comprised of these concepts.

1. Vocational identity is the opinions of an individual towards the objectives, social values, and other factors of a vocation he/she is engaged in. The formation of vocational identity is closely linked to and interactive with the development of vocational competence.
2. Commitment is the intention of an employee towards his/her occupation and/or enterprise, including vocational commitment and organizational commitment. Organizational commitment is one's emotional ties with the enterprise, having nothing to do with specific work content. Vocational commitment is one's emotional ties with the vocation, and one's reluctance to change his/her vocation due to his/her devotion to the vocation and his/her internalization of social norms. Vocational commitment is both an important part and an embodiment of vocational ethics.
3. Work ethics, or the virtue of hard work, is one's work motivations including diligence, obedience, and punctuality, which are not associated with any specific job. Work ethics differs from vocational ethics in terms of motivation: the former is formed passively as a result of external influences, while the latter is formed spontaneously by practitioners (Heinemann & Rauner, 2009).

The Evaluation Technology Adopted and the Process

Large-Scale Diagnosis

During the research, the large-scale diagnostic method is adopted to diagnose and evaluate such variables as vocational identity, commitment, and learning environment features. It will not only give a description of the status quo, but also find out the differences among different testees, and testees of different countries and regions, and analyze the reasons behind.

The Selection and Development of Relevant Scales

Based on present theoretical and experimental studies, KOMET program has developed a set of scales compatible with the characteristics of vocational school students to diagnose vocational identity, (vocational and organizational) commitment, and work ethics. Vocational identity scale focuses on following three aspects: 1) concern for the role of work activities in a vocation (vocational orientation); 2) concern for the

design of work and technology (vocational competence); 3) concern for work quality (quality awareness). To measure organizational commitment, the research adopted the internationally recognized P. J. Meyer scale and selected three dimensions: normative commitment, affective commitment and continuous commitment (Meyer et al, 1993). As students are not in the position to decide if they will be able to stay in the enterprises, the correlation with work motivation is not very important. Therefore, we revised the items of the scale. For the measurement of vocational commitment, we employed G. J. Blau's career commitment measurement and vocational commitment scale (Blau, 1988), with fine tuning made based on the newest research results. For work ethics measurement, the research used only three items, namely, "punctuality, reliability, and motivation", instead of putting forward more normalization requirements.

(Original) Scale Quality

The German partner of KOMET project team reviewed the quality of the above scales. As revealed by the results, Cronbach's Alpha of the vocational identity scale was 0.73, remarkable for a six-item scale; the Cronbach's Alpha of organizational commitment and vocational commitment scales reached 0.87, showing high inherent correlation degree among items; the Cronbach's Alpha of work ethics was as low as 0.52, which is common in short scales and in conformity with the basic requirements of psychometrics (Niemi, et al. 2004). This proves that the scales provide a reliable technical basis for the diagnosis of the vocational identity and commitment of vocational school students.

Development of Background Information Questionnaire

The purpose of background information questionnaire survey is to collect characteristic data about students, enterprises and vocational institutions, and analyze the impact of background conditions on vocational education and the development of student's vocational competence.

Explorations in the Sinicization of Scale Structure and Its Verification

To reconcile international scales with Chinese conditions, we need to find out the structural differences between Chinese and foreign scales, as well as the reasons for the differences, and make modifications accordingly. Both exploratory factor analysis and confirmatory factor analysis were used to get the construct validity of the scales (Wu, 2000; Meng, Liu & Zhao, 2006). In order to ensure the definitiveness, stability and reliability of measured traits, the research adopted cross-validation, by which one sample was applied to perform exploratory factor analysis (EFA) for getting a factorial structure, and another sample was used for confirmatory factor analysis before commenting on the model's goodness-of-fit with the data (Jiang, 1999).

Investigation and Analysis Process

The author handed out 1,100 questionnaires in the vocational schools in 6 province and municipality of Guangdong, Zhejiang, Beijing, Sichuan, Fujian, Hubei, and retrieved 1,001, 88.91% of which were valid. In accordance with the requirement of the research, the data was divided into two groups by odd/even number, and one group of data were drawn at random for EFA, the other group of data for CFA. Then cross-validation was then made to the scale structure. SPSS 13.0 For Windows and AMOS 18.0 software package were applied for reliability and validity test. After structure verification, the international scale was modified in accordance with factor analysis results. Afterwards, the above statistical softwares were used to analyze the data and find out the influences of the individual's background and teaching practice background variables on the vocational ethics development of vocational school students.

Explorations in the Scale Structure

Analysis of the Items of Commitment and Vocational Identity Scales

Critical ratio (CR) and correlation analysis between each item score and the total score were used for analyzing the quality of the scale (specific data omitted). The results showed that the CRs of all 21 items of the questionnaire reached a significant level ($p < 0.01$); the 21 items showed significant correlation with the total score of the questionnaire. Of which, 19 items exhibited correlation coefficients of higher than 0.4, and 2 items less than 0.2. These 2 items of poor quality were removed¹.

Exploratory Factor Analysis of the Commitment and Professional Identity Scales

To perform EFA to the 445 valid questionnaires, the rest 19 items were used. First, the fitness of the data was examined by KMO and Bartlett's Test of Sphericity. The KMO value was 0.927 and the Bartlett Chi-Square Value 3431.454 (degree of freedom: 171, $P = 0.000$), suggesting that correlation matrixes of the parent group shared common factors and were suitable for factor analysis. Principal component analysis, as well as varimax, was used to perform orthogonal rotation, and two factors with eigenvalues over 1 (specific data omitted) were obtained. In accordance with related standards (Wei, 2008), after the four nonsingle-level items (items: k_91, k_73, k_79, k_77) were discarded, factor analysis was conducted to the rest items; then the KMO value was 0.906, and Bartlett's Test of Sphericity chi-square value was 2413.529 (degree of freedom: 105, $P = 0.000$), showing that the correlation matrixes of the parent group shared common factors and were applicable for factor analysis. Orthogonal rotation was performed by virtue of principal component analysis and varimax, and two factors with eigenvalues over 1 were obtained. The results are indicated in Table 1.

¹ Item 83 and 89 are contrary thinking questions. Possibly because of the relatively weak reading ability of vocational school students, they did not understand the meaning, which caused the loss of discriminant validity of these two items.

Table 1
Abstract II of the Factor Analysis of Students' Commitment and Vocational Identity Questionnaires

Item	Explained Variance	Cumulative Explained Variance	Component		
			Factor 1	Factor 2	Communality
k_76	25.679%	25.679%	0.822	0.054	0.679
k_93			0.710	0.199	0.543
k_72			0.702	0.203	0.534
k_96			0.689	0.267	0.545
k_95			0.678	0.171	0.488
k_80			0.580	0.376	0.477
k_85			0.563	0.201	0.357
k_74			0.469	0.372	0.359
k_82	24.157%	49.837%	0.132	0.787	0.637
k_81			0.072	0.749	0.566
k_88			0.184	0.723	0.557
k_87			0.233	0.637	0.460
k_78			0.326	0.614	0.483
k_86			0.337	0.614	0.490
k_94			0.207	0.508	0.301
Eigenvalue			3.852	3.624	

Note1. Items in blue rows come under factor 1;
 2. Items in yellow rows fall under factor 2.

The two factors explained 49.837% of the total variance. The maximum loading of the items was 0.822, and the minimum loading 0.469. The communalities of all items ranged from 0.301 to 0.679. Thereby a new scale structure formed. The new scale was made up of two factors. The first factor consisted of eight items stemming from the “organizational commitment” and “vocational commitment” of the original scales, and so it was named “commitment”. Its eigenvalue was 3.852, and its variance contribution rate after orthogonal rotation was 25.679%; the second factor had seven items, five of which were from “vocational identity” and two from “work ethics”. The eigenvalue was 3.624, and the variance contribution rate was 24.157%. This shows that Chinese students have quite different understanding of “vocational ethics” from German students in that their idea of “vocational ethics” is inclusive of the vocational identity and work ethics of German students. The reason why the items were removed was that each of which does not belong to one factor level. This reflects that Chinese students have vague understanding of these contents and cannot distinguish the factor level which the item belong to.

Table2
The Items under “Vocational Ethics” Factor in Vocational School Students Scale

China	Germany	Item Number, Item
Vocational ethics	Vocational identity	[k_77] During the internship period, I am concerned with how my work contribute to the whole company/work unit
	Vocational identity	[k_82] Working in a vocation means to deliver quality(as a professional, I strive to be up to the professional standard)
	Vocational identity	[k_86] I am wholly dedicated to the work
	Vocational identity	[k_87] During the internship period, I am concerned with how my work is related to my major
	Vocational identity	[k_88] Sometimes I will think about how to change my work to better accomplish my task
	Vocational identity	[k_94] I want to have a say in my work
	Work ethics	[k_73] I am motivated, no matter what I have to do
	Work ethics	[k_81] I am always punctual, even if the organization of work does not require it
	Work ethics	[k_78] I am reliable, no matter what I have to do

Interpretation of the Data

About Vocational Identity, Vocational Commitment, Organizational Commitment, and Work Ethics

This research reveals that Chinese students’ views on vocational identity, vocational commitment, organizational commitment, and work ethics are not in complete accord with those of German students. They can not distinguish vocational identity from work ethics, vocational commitment from organizational commitment, which is perhaps related to the features of China’s social culture and industrial culture.

Vocational identity vs work ethics.

“Vocational identity scale” measures the cognitive intention and emotional intention that influence the formation of vocational competence during the career development process. “Work ethics scale” is not targeted at any specific, external work incentives. The possible reasons why China’s vocational students can not distinguish vocational identity from work ethics are:

- a) Different traditions and values. Westerners value individuality, which, combined with the profound impact of the “vocation” notion of the Protestant Ethic, makes German students more sensitive to endogenous vocational identity and exogenous work ethics. China’s traditional morality stresses human relations (such as the relations between sovereign and ministers, fathers and sons, teachers and students), and the basic spirit is the cultivation of harmonious relation and good faith, as well

as the conformance and harmony of interpersonal relationship. This culture excels in its overall cohesive forces (Luo & Zheng, 2007), but easily lends itself to a tendency of belittling the worth of individuals and hence the insensitivity to the endogenous vocational identity and the confusion with work ethics.

- b) Chinese and westerners have different ideas about vocation and vocational ethics. From the perspective of livelihood, Chinese people see a vocation mainly as a means of living, and whether or not one identifies with the vocation that he/she is engaged in is a less important issue. So there is a strong utilitarian orientation. In contrast, German people emphasize and value the impact of man's subjectivity on vocation, and an individual would like to and is able to initiatively think about and judge whether he/she is following a career actively or passively. However, in China, we are accustomed to accept the constraint, regulation, and limitation of vocational ethics on employed people, and hence exogenous work ethics. Westerners pay more attention to the subjective nature of vocational ethics, so they are able to distinguish between work ethics and vocational identity.
- c) The defect in vocational ethics education. With an obvious instrumentalized value orientation tendency, China's vocational ethics education tends to treat students as passive tools and rebuilt them into "standardized products" through acquisition of standardized knowledge, which accounts for the lack of subjective consciousness among the students (Yuan & Wang, 2007).

Vocational commitment vs organizational commitment.

Students of China's vocational schools are unable to distinguish between vocational commitment and organizational commitment. There are following probable reasons for this:

- a) Specialty setting. Chinese vocational schools carry out education centering on "specialty", while German vocational education focus on "Ausbildungsberuf" (training vocation). By name, "Specialty" and "Ausbildungsberuf" are apparently different from each other. For example, in China, the specialty names listed in Catalogue Of Specialties Of Secondary Vocational Schools fall into following four types: 1) materialized nouns for describing things, e.g. forestry; 2) production and operation activities, e.g. building equipment installation; 3) technologies, e.g. electronics and information technology; 4) personalized nouns for describing vocations: e.g. accounting (but examples of this kind are few in number). Explanations to the National Guiding Catalogue of Disciplines and Specialties for Higher Vocational Schools (Interim) specifies that, "a specialty...is generally named 'xx technology'". Because this way of stating a specialty is depersonalized and has nothing to do with a vocation, Chinese students have inadequate understanding of "vocation" and are hard to form emotional ties with an vocation.

- b)The schooling system of vocational education. Given China's present schooling model, vocational institution students are unlikely to have a long-period internship in the enterprises, which makes it hard for them to form a stable affectionate relation with the enterprises, so they tend to confuse it with their affection towards their majors.
- c)Cultural features. At the core of Chinese tradition is collectivism, and this may cause students to ignore their own vocational activities in the enterprises (organizations) where they take their internship, thereby confusing their emotional ties with vocations and that with enterprises.

Analysis of Students' Commitment and Vocational Ethics

First of all, statistics was made to the tested data under the two factors and items thereof: maximum value, minimum value, mid-value, mode, mean value, standard deviation, degree of skewness, and Kurtosis (specific data omitted). The mean values of commitment and vocational ethics were 3.33 and 3.86 respectively, which were at a medium level.

The overall situation.

Among the students, the perception that "the company is a bit like feeling at home" (k_72) (3.04) reported the lowest score, and the mean score for the perception that "I want to stay at my company in the future, even if I have got the chance to go elsewhere" (k_76) (3.21) and that "I do not want to change my vocation in the future" (k_85) (3.24) was also very low. The mean score for the perception that "I am always punctual, even if the organization of work does not require it" (k_81) (4.06) was the highest and above average. This shows that even though the students were very punctual, they did not have strong emotional ties with the enterprises, nor did they have strong emotional ties with their majors. This is a suggestion that, on the one hand, vocational institutions should reflect on their specialty settings; on the other, enterprises should provide students with more attractive positions and jobs to help students build emotional ties with the enterprise and attract more high-quality talents.

The commitment and vocational ethics of students of different tested institutions.

Efforts were taken to sum up, describe, and analyze the commitment and vocational ethics of students of different tested institutions. The results are indicated in Figure 1.

The average commitment score of tested students in Guangdong was the highest (3.4524), and students in Zhejiang exhibited a mean commitment score of 3.0972, the lowest of all samples. The mean commitment scores of the students in six institutions were higher than the threshold value 3 and at a middle level. The tested schools in Guangdong had a good cooperation with the enterprises, and students there had

relatively rich work experiences in the enterprises. Many students of tested college in Zhejiang were from rich families and showed poor attitude to labor. The testee in Hubei was an ordinary college, while tested institutions in other provinces were either state-level key schools/colleges or demonstration schools/colleges. All these were reflected in commitment scores.

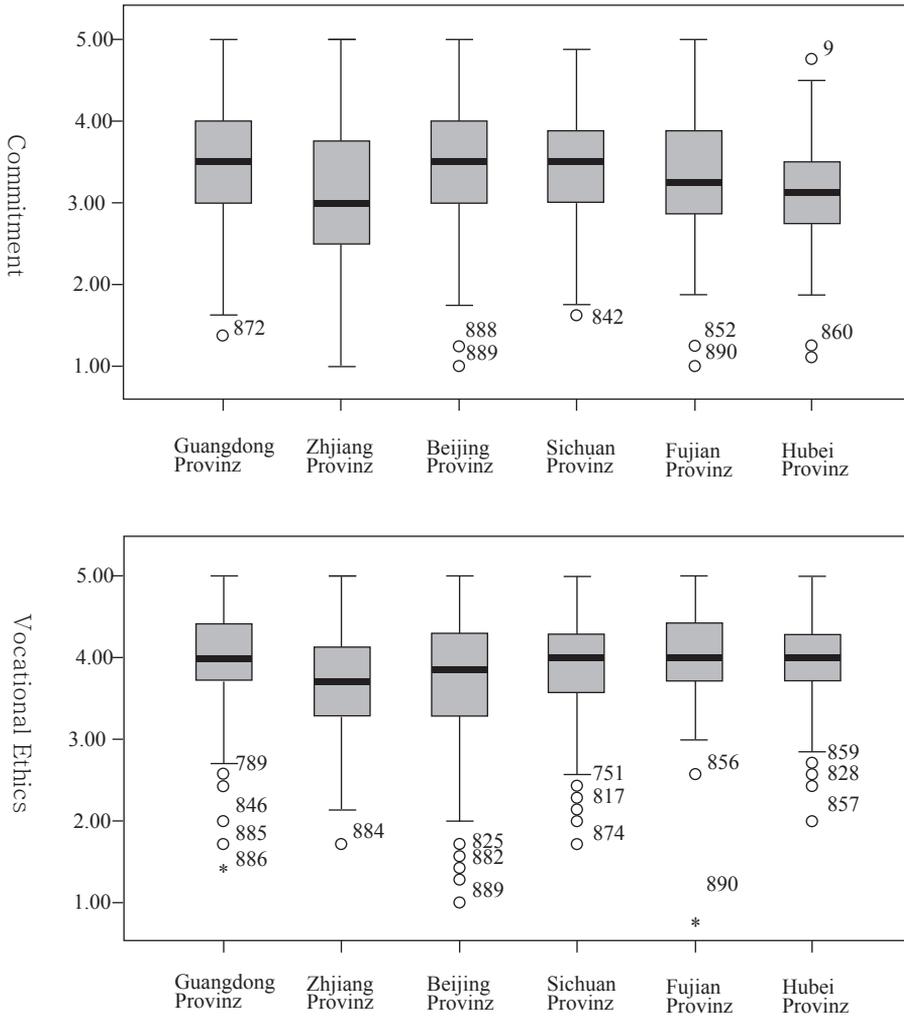


Figure 1. The Box Plot of Commitment and Vocational Ethics of Students in Different Institutions

The tested students in Fujian showed medium-level commitment, but their average score of vocational ethics was the highest, 4.0140, which was above average. The possible reason was that, the test in Fujian was carried out in the enterprises, where students had more profound understanding and reflection regarding to keeping

disciplines and other work ethics (they can not distinguish between vocational identity and work ethics). The test results of school in Beijing varied greatly, which might be attributed to the fact that many students in the tested classes were not serious about filling up the questionnaires, but some students, who were more docile, finished the whole questionnaires carefully because of the presence of their teachers, hence delivering quite different results from other students.

The commitment and vocational ethics of students of different types of specialties.

Statistical analysis was carried out on the commitment and vocational ethics of students of different types of specialties. The results are illustrated in Table 3:

Table 3
Statistics of the Commitment and Vocational Ethics of Students of Technical or Service Specialties

Variable	Specialty	Mid Value	Average Value	Standard Deviation	Degree of Skinless	Kurtosis
Factor 1: Commitment	Technology	3.5	3.3926	0.71778	-0.280	-0.010
	Service	3.25	3.2093	0.68900	-0.340	-0.186
Factor 2: Vocational Ethics	Technology	4	3.8497	0.67143	-0.746	0.810
	Service	4	3.8814	0.66910	-1.223	2.557

The mean commitment score for technology students was at a medium level (3.3926); service students exhibited a lower mean commitment score (3.2093). The vocational ethics scores of these two groups were 3.849 and 3.8814, respectively, which were at a middle level. Chi-square test was performed to measure the correlation of commitment and vocational ethics with these two specialties (specific results omitted), and the results were that the P values of Pearson Chi-Square, likelihood-ratio chi-square, Fisher exact probability, and linear correlation chi-square were all less than 0.05, revealing a difference in commitment and vocational ethics between the two groups of students.

Technology students showed a stronger emotional bond with the enterprises and specialties than students of service, but their vocational ethics was comparatively weak, which coincides with our usual experience. Students of technology have relatively stable learning contents, and the enterprises where they have their internship are relatively fixed by production field, which is the reason for their high commitment. As service specialties cover a wide range, and the area of employment is not narrowly targeted, students have widely varied ideas about career development, and hence their great discrepancies in commitment. However, service specialties are marked by a large number of female students who are usually better disciplined; thereby exhibiting high vocational ethics scores (work ethics, to be exact, rather than vocational identity) in the measurement results.

The commitment and vocational ethics of students of different specialties.

According to the measurement, students of different specialties exhibited different levels of commitment. The mid-value of commitment score was 3.375 and the mean value was 3.33. The possible reasons for the varied commitment scores are: 1) the influences of the attractiveness and potentials of different specialties; 2) the influences of instruction and learning; 3) the influences of enterprises; 4) the result of joint effect of several reasons. The commitments of several specialties are shown in Figure 2.

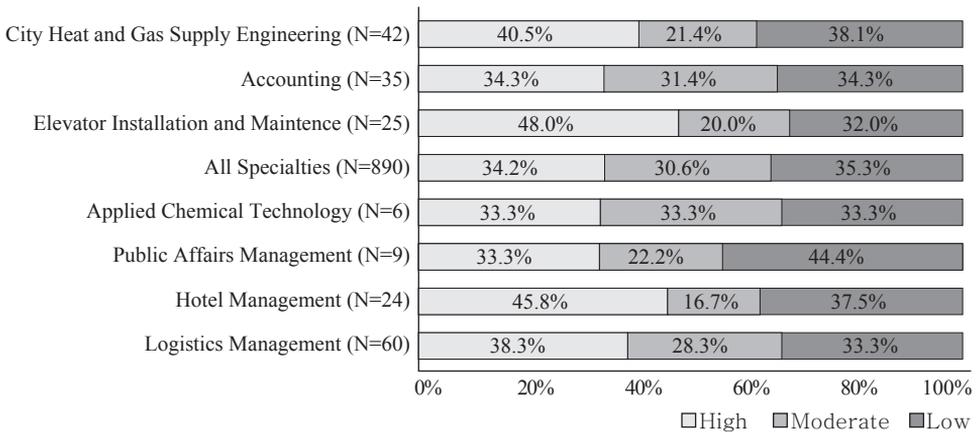


Figure 2. Commitments of Students of Several Drawn Specialties (In a Decreasing Order by Mean Commitment Score)

City heat and gas supply engineering: with clearly-positioned specialties and high quality teaching, this is a characteristic specialty of the tested school, and the targeted enterprises where students have internships are monopolistic. Students of this specialty exhibited high commitment. Accounting: with explicit teaching contents, the specialty is clearly outlined, and the targeted enterprises and banks are very popular among students, who showed high commitment. Logistics management: owing to imprecise training objectives and learning contents of this specialty, as well as somewhat obscure employment prospects, especially upon the discovery of the great discrepancy between pre-college expectation and reality of internship, students of this specialty reported low commitment, though logistics management is considered as a popular specialty. Hotel management: hotels usually provided students with positions requiring only simple operations, which saps the students' enthusiasm, harms their identity with the specialty and emotional ties with the hotels, and lowers their commitment. To sum up, the low commitment score of students of some specialties has to do with the characteristics of specialty setting. If a specialty doesn't have clearly defined the profile of competence requirements, students may feel that they can learn nothing from the education and show low commitment. In addition, the work organization and task arrangement of the enterprises are also very important. Providing students with only simple, repetitive works seldom leads to students' high commitment.

The vocational ethics of students with different specialties differed greatly. The mid-value of vocational ethics score was 4, with a mean value of 3.86. The vocational ethics defined in this research include both subjective and objective factors: 1) the attitude or consciousness formed during the process of identifying with the vocation and competence development; 2) norms that must be followed according to morality. The vocational ethics of students of several specialties is indicated in Figure 3:

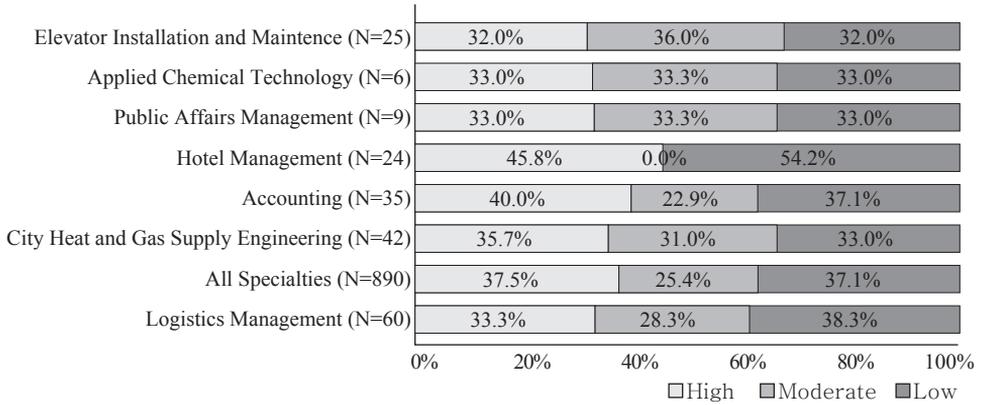


Figure 3. The Vocational Ethics of Students of Several Specialties (In a Decreasing Order by Mean Commitment Score)

Chemistry: this is a special specialty which emphasizes safety and the consciousness of normalization. Students of this specialty exhibited a high level of vocational ethics (probably more of work ethics). Elevator installation and maintenance: this group of students presented high commitment and vocational ethics, an indication of the mutual complementation between external and internal motivations. Public affairs management: the students showed low commitment, but high vocational ethics, implying that the motivation of the students’ vocational ethics was extrinsic; in spite of insufficient inner motivation, the students still exhibited good vocational ethics (actually work ethics) thanks to strict management. Hotel management: the students’ commitment was weak, but their vocational ethics was strong, which was the case for students specialized in public affairs management. Vocational ethics, which is constantly dominated by external motivations, is not favorable for the growth of students and their personality development, and this is likely lead to a non-humanistic tendency in education.

Conclusions and Suggestions

Conclusions of the research: Vocational institution students in different countries have different understanding of vocational identity, vocational commitment, organizational commitment, and work ethics. Compared with German students, Chinese

students are unable to distinguish between vocational identity and work ethics, vocational commitment and organizational commitment. Presently the commitment and vocational ethics of China's vocational institution students were at a middle level. Students of different institutions and different specialties exhibit significantly different levels of commitment and vocational ethics, which has immediate relationship with specialty setting of the school and work organisation of the enterprise.

Therefore, suggestions can be put forward as follows: 1) We should form an "vocation" awareness and concept in China and clarify the relation between "specialty" and "vocation". We can never enhance the vocational ethics and commitment of practitioners fundamentally unless the vocational education has a "vocational basis". In view of the emerging humanism in China and the momentum of personality emancipation, the importance of work ethics will be further lessened, which presents a high requirement for vocational identity. 2) We should strengthen the normalization and scientification of internship in the enterprises. Internship in the enterprises is an important step for students in the socialization process of entering into vocational practice community. It will not only help young people get prepared for career, but also contribute to the molding of professionals complying with specific norms of vocational ethics. As an important approach to build vocational identity, vocational ethics and commitment, internship is of great significance to a mature vocational community (Heinz, 1995). We must improve the organization of work and business process, so as to promote the formation and development of the vocational identity and commitment for interns and employees in the enterprises. This is important for enterprises to overcome the negative impacts brought by the instabilities of work and psychology of employees (for example, suicides in Foxconn) and for establishing a harmonious society.

Prospect

Diagnostic research of vocational ethics is a complex subject, which presents a big challenge for Large-Scale Diagnostic instrument. Researches in international industrial sociology and organizational psychology have give rise to many scales. If, under the guidance of modern vocational education theories, we can modify and improve these scales, we will be able to conduct diagnosis and comment on the vocational ethics development status for students in different vocational development stages. This is of great value to the development of vocational education: first, vocational management authorities may exercise scientific management and monitoring over education quality, making use of the key data about developments in vocational education acquired from the diagnosis; second, teachers may utilize the diagnostic methods and results to make a profound analysis on the problems in teaching design and implementation; third, the diagnosis can also provide a solid, reliable empirical basis for regional and international comparative researches in vocational education. All the data and knowledge about vocational education quality can help relevant vocational institutions to cast away wild guesses, prejudices, and simplistic aspirations, and to carry out constructive dialogues

and cooperation on the basis of quantitative data.

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An Inconvenient Truth in Taiwan: A Comparison of Income Level between General High School and Vocational High School Graduates without Further Schooling

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ABSTRACT The purpose of this study is to compare the income level of graduates from general and vocational high schools from 1977 to 2006. Income level is generally used as an important indicator of labor productivity. Secondary data released by the Taiwan government were collected and analyzed. Contrary to the common belief that vocational high school graduates should have higher on-average income level than general high schools graduates, this study shows the opposite for the past 30 years. A pair-t test was conducted and confirmed this discrepancy statistically. Both human capital theory and screen hypothesis were employed to explain and discuss the study result. This result, an inconvenient truth, may be unexpected, but it is important to recognize as it provides profound insights for both vocational educators and policy-makers.

KEY WORDS labor productivity, vocational high school, vocational education, Taiwan, income level

Introduction

For many years Taiwan has implemented divergent education at the secondary education level, and its official source of law can be traced to the “Vocational School Act” of 1932 promulgated by the National Government (He, 1989; Xu, 1994). The Act was amended in 1947 and 1976, but the first clause regarding the education goals of vocational schools has not been amended. A primary reason that the National Government could smoothly re-promote the divergent system with its emphasis on vocational education after moving to Taiwan was that it already had divergent law resources (Lyau & Thomas, 1994). Most important among these resources was the original divergent regime that had been promulgated during the Japanese Occupational Period. In 1919 the Japanese Government announced “Taiwan Educational Decrees”

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that diverted education into two streams, vocational and general, and trained Taiwanese vocational students with elementary production skills to do production and transportation jobs in various industries (Shi, 1993; Giang, 2002). The Japanese Government actively promoted vocational education, encouraging outstanding Taiwanese youths to study in vocational schools. Thus, vocational education was already well established before the war, and "the National Government could receive Taiwan's vocational education which already had a based structure" (Shi, 1993).

Having a precedent for the existing divergent structure, the National Government smoothly established the Three-Three High and Primary Level vocational schools, the latter having been stopped since 1968 when the implementation of nine-year compulsory education was announced. Not until the 1995 implementation of the comprehensive high school did the divergent system of post-secondary education start to show signs of combining programs. Since 2006, the numbers of the general and vocational senior high schools have been 321 and 156 respectively, the student numbers are 406,316 and 346,563, and the ratio is 54:46 (Ministry of Education, 2009). Since the past half century, the main strategies of the divergent system have mostly been to meet the demands of economic constructions and expand the number of vocational school students (Qiu, 1980; Qiu, 1981). As a result, since 1989 the employed population with a vocational senior high school diploma has accounted for about one-fifth of the total employed population in the labor market. After 1995 the ratio of vocational senior high school graduates in the total labor force rose as high as a quarter, about 2.5 times the economically active population.

Because the goal of vocational school education has always been to train basic-level technical personnel, whereas the goal of general education has been to prepare students for academic research, graduates from vocational schools should have better employment performance in technical occupations than graduates from general high schools. After reviewing the documents that discuss this question, the authors did find some research to indicate that the economic effectiveness of vocational education measured in terms of labor force participation rate, weekly working hours, monthly salary income, and current seniority, was significantly higher than that of general education (Wang, 1996). However, a research report announced that within the 10 year period from 1983 to 1992 a vocational senior high school education provided only small, short-term income benefits (Wang, & Xie, 1993). In addition, some economists who have observed Taiwan educational investment returns over the long term have indicated that from the point of view of producing student numbers, vocational schools are more effective than general high schools, but from the point of view of labor market performance "the effectiveness of the vocational senior high school education is not exactly higher than the general senior high school education" (Yang, & Wu, 1996).

According to the current documents, there has been no unanimous conclusion regarding the labor market performance of vocational high school graduates. Therefore, to determine whether the vocational schools have achieved their employment-oriented educational goals, this research collects the secondary data published by the Taiwan government over a period of close to 30 years (from 1977 to 2006). The data includes

information regarding the income level of graduates from both the general high schools and the vocational high schools. Using income level as an indicator of labor productivity, this study aims to explore whether vocational high school students graduating between 1977 and 2006 have higher productivity than those who graduated from general high schools during the same period.

Data Resource

Table 1 shows salary information for the past 30 years for both G.H. and V.H. school graduates. The “G.H.” and “V.H.” stand for “General High School Graduates” and “Vocational High School Graduates,” respectively. This data set was gathered from the annual “Report on the manpower utilization survey, Taiwan Area, R.O.C.” (Directorate-General of Budget, Accounting and Statistics, Executive Yuan, Taiwan, R.O.C.). The report gives information on workers who were surveyed by questions such as: “How much is your monthly revenue from your main task?” The revenue categories included salaries, bonuses, commissions, overtime payments and tips, but did not include non-recurring revenue items, such as birth and education allowances, etc.

Table 1
Income Level of General High and Vocational High School Graduates from 1977~2006

Year		1977	1978	1979	1980	1981
Income	G.H.	5,247	5,918	7,144	8,536	10,350
Level	V.H.	4,715	5,489	6,457	7,555	9,440
Year		1982	1983	1984	1985	1986
Income	G.H.	11,438	12,123	12,333	12,947	13,842
Level	V.H.	10,446	10,818	11,232	11,629	11,365
Year		1987	1988	1989	1990	1991
Income	G.H.	13,918	15,409	17,885	19,503	22,245
Level	V.H.	1,266	14,134	16,257	18,278	20,373
Year		1992	1993	1994	1995	1996
Income	G.H.	24,261	26,628	28,069	29,375	30,121
Level	V.H.	22,576	24,626	26,680	27,865	28,617
Year		1997	1998	1999	2000	2001
Income	G.H.	30,982	31,631	32,371	33,268	31,613
Level	V.H.	29,065	29,585	29,876	29,748	29,482
Year		2002	2003	2004	2005	2006
Income	G.H.	32,229	31,613	31,060	31,272	30,776
Level	V.H.	29,020	28,854	29,223	29,860	29,934

Source : Directorate-General of Budget, Accounting and Statistics, Executive Yuan, R.O.C. (Taiwan), Council for Economic Planning and Development (1977) ~ (2006), Report on the manpower utilization survey, Taiwan Area, R.O.C. Taipei: Author.

Note : ** “G.H.” stands for “General High School graduates”; “V.H.” stands for “Vocational High School graduates.”

All samples selected by this paper were those high school (Including GH & VH) graduates who entered the labor market without any further schooling. They would not be included in this paper if they earned further degree in a formal educational system. In other words, high school diploma is this study’s samples’ highest degree. Throughout this paper, therefore, when mentioning the graduates of these school system in Taiwan, we mean those GH & VH graduates who were in the labor market and without any further degree beyond high school diploma at the time of conducting the survey by the Directorate-General of Budget, Accounting and Statistics, Executive Yuan, Taiwan

A Comparison and Discussion of the Income Level of Vocational and General High School Graduates

Figure 1 shows the income level: over the years the monthly income of high school graduates is consistently higher than that of vocational graduates, the average gap between them being NT\$ 1604 per month, which is not at all negligible. Since the axis spacing line in Figure 1 shows NT\$ 5000 as the unit, it was difficult to highlight the differences between the two groups. The author further conducted a paired sample t-test, and the results were $t = 11.77$ ($df = 29$), which indicates a .00 significance level (see Table 2). In fact, vocational graduates did not only receive less than a high income, their income was significantly lower than that of general high school graduates, and the reasons behind this deserve further exploration. In this study, labor economics, human capital theory and the screening hypothesis are used to try to explain why long-standing vocational graduates earn less income than high school graduates.

Table 2
Paired Samples Test Table on the Average Income of General High School and Vocational High School Graduates

	Mean	Std. Deviation	df	t	P-value
G.H	21,470.23	9787.08	29	11.77	.000***
V.H	19,865.50	9285.55			

Note : ** “G.H.” stands for “General High School graduates”; “V.H.” stands for “Vocational High School graduates.”

According to Wang & Xie (1995) the pay income benefits of vocational education are only short-term, which contrasts with traditional expectations. Considering the expensive equipment needed by vocational students, their intensive skills training, and their easier access to the job market, one might expect their income to be higher than that of general high school graduates.

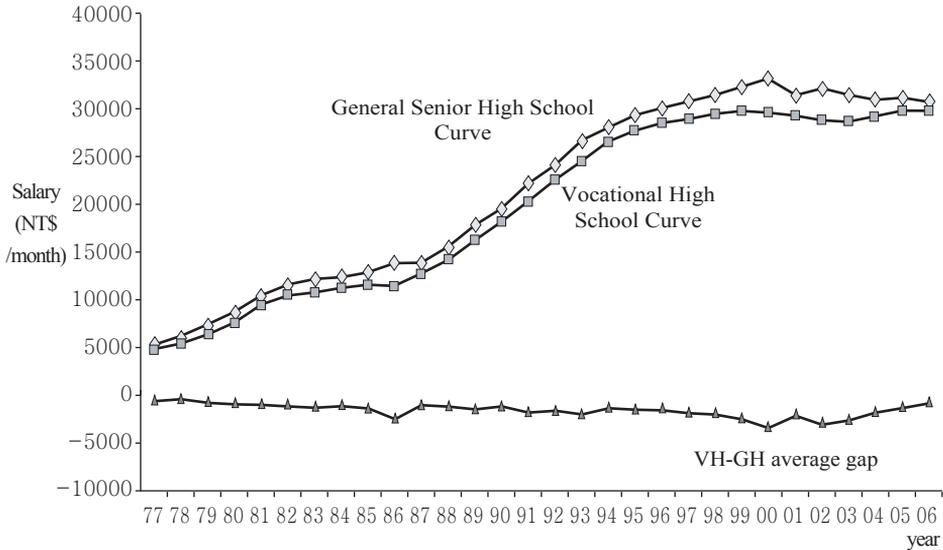


Figure 1. The Long-Term Trend of Income Level for General High School and Vocational High School Graduates

Human capital theory suggests that people can be seen as a kind of capital, and that human capital stock can be improved through education and training, thus increasing productivity and productivity gains in the job market as measured by wages (Becker, 1962; Schultz, 1961). Becker goes one step further by distinguishing general human capital from specific human capital: the difference is that the former can be transferred to different working situations requiring various kinds of knowledge and skills, whereas the latter has application to specific work situations. According to this classification, the curriculum training in the general senior high schools should be able to increase students' general human capital, while the curriculum in the vocational senior high schools should be able to increase specific human capital. Between 1974 and 1986, the engineering divisions of the vocational senior high school schools implemented "the unit-trade training model," which aimed at specific vocation and the design of a training curriculum. After 1986, it provided the cluster curriculum as one of the industrial division options in the vocational senior high schools; however, due to the human cultivation of professional groups as the goal, it still focused on specific knowledge and skills trainings, albeit the kind that can be transferred and applied to other, similar working environments.

As reflected in income, it seems the vocational senior high school graduates who have received specific knowledge and skills trainings have lower productivity in the job market than general senior high school graduates. There are two possible reasons for this. One is that the vocational senior high schools are ineffective at teaching and do not reach their educational goals. According to human capital theory, educational training can increase students' human capital stock and salary income. It follows that if they

reach their goals, the salary of vocational senior high school graduates should, at the very least, not be lower than that of general senior high school graduates.

The other possible reason their salary is, in fact, lower reflects the opposite hypothesis to that stated above. Precisely because the vocational senior high schools have reached their employment-oriented educational goals, their graduates have limited knowledge and skills pertinent only to specific occupations; thus when they enter the labor market they have to relearn general skills, especially in Taiwan which has experienced nearly two decades of rapid advances in industrial technology. Vocational senior high school graduates cannot adapt to these changes and as a result they have lower productivities, lower salary incomes, and even a higher unemployment rate. If the curriculum of the vocational senior high schools cannot meet with the demands of industry, the human power that has been cultivated is uncompetitive in the long run.

In addition to human capital theory, the different income levels of vocational and general high school graduates might also be explained by the screening hypothesis. According to this hypothesis, education does not have any intrinsic social value, nor does it enhance personal productivity (Quiggin, 1999). Instead, the whole educational system is at best a screening mechanism to filter the different innate abilities of students into different types of schools (Jiang, 1995; Chen, 1997). Without labor force market information, employers cannot really observe the human capital stock (productivity) of applicants. Thus, employers often measure the productivity of job seekers by their diplomas or graduating school, and they use these as a salary payment standard. The reason that employers are willing to use the employees' academic background as the standard for determining salaries is that employers believe innate abilities are related to productivities. People with higher abilities learn faster; therefore their marginal education costs are lower and they have higher educational levels.

If the screening hypothesis is applied to the current status of Taiwan's educational system, it might be easier to understand the reason for the salary income difference between general and vocational senior high school graduates. Secondary education has been divergent in Taiwan for over half a century. Before the implementation of nine-year compulsory education in 1968, the separation into general junior/vocational junior high schools began right after elementary school. When nine years of education became compulsory, the separation into two streams was pushed up to the secondary level. Traditionally, the priority of students and parents has been to the general senior high school and to public schools rather than private schools. However, because the demand exceeds the supply, students must pass entrance exams in the general senior high schools, vocational senior high schools and junior colleges, and students who are not qualified for the school of their choice either re-take their exams the next time they are offered, or take second exams.

The screening mechanism of post-secondary education applies to the three schooling systems and it not only plays an important role in selecting students with different abilities, but its impartiality has been quite trusted. If employers believe that innate learning abilities are related to productivities and they do not have enough information to determine employee productivities during the hiring process, they might hire on the

basis of school type and use this as the payment standard, with general education being preferred to vocational education. If this is the case, then it is unsurprising that the income levels of vocational senior high school graduates have always been lower than that of the general senior high school graduates.

In Taiwan's labor force market, are the hiring practices of employers diploma-oriented or human capital oriented? Jiang (1995) points out that when economic theory and econometric models are used to determine the importance of credentials in the labor force market in Taiwan, credentials are not as important as what people have imagined. However, two recent studies by Li (1995) and Zhang (1998) show the opposite finding: a diploma has become the main selection criterion within modern society. This finding supports the screening hypothesis (Li, 1995) Because personal abilities are difficult to assess, the screening theory seems to be applicable to the recruitment pattern of Taiwan enterprises, with variations only according to the differences among enterprises, differences that correspond to different standards of diploma screening (Zhang, 1998).

However, since the aforementioned researches do not use general and vocational senior high school graduates in the labor force market in Taiwan as empirical objects, it is impossible to finally determine which theory is more able to explain the long-term salary income differences between these two groups. What does seem certain is that the diversity and complexity of the job market in Taiwan means that these two theories, or even other labor economic theories, such as job-match theory and public choice model (Heijke & Koesiag, 1999; Quiggin, 1999), can only be used as partial explanations of the salary income difference between general and vocational senior high school graduates

Conclusions

This research utilizes the government publications each year, collects the five indicators of performance in the labor force market, and compares and analyzes the differences in income level between vocational and general senior high school graduates over the long term to test the achievement level of the educational goals of the vocational senior high schools. The income levels of the general senior high school graduates for the past 25 years have been on average significantly higher than that of the vocational senior high school graduates, the average difference being NT\$1,604 per month. This discrepancy is suitable for using human capital theory and screening theory in labor economics as explanatory tools.

The finding of this study seems to completely negate the effectiveness of vocational senior high school education. The domestic vocational senior high schools have employment-oriented educational goals; therefore, their operating cost is normally greater than that of general senior high schools, and their students put more time into internships and lab exercises. Why, then, do the graduates of vocational schools earn significantly less than those with a general education?

Whether abrogating the vocational senior high schools or turning them into general senior high schools can improve the employment competitiveness of post-secondary

school graduates is a question that does not have a simple or straightforward answer. On the surface, it seems that the vocational senior high school education has been ineffective, leading to an inequitable gap between the income levels of vocational and general high school graduates; conversely, one might argue that the gap would be even bigger were it not for the vocational schools, which have raised the standard of education among vocational students. Evidently, further testing needs to be done before the correct inference can be drawn. In the meantime, students should be placed according to their educational goals in what seems to be the appropriate school at this time when the majority of vocational schools are wanting to transition into general schools. Only by enabling all students to reach their employment goals can educators and other professionals in learning environments uphold the dignity of post-secondary education in Taiwan.

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Challenges of Vocational Education in Japan: From the View Point of International Comparison, Especially in Asian Area

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ABSTRACT In this study, vocational education and training(VET) in Japan was analyzed, based on “two historical axes and three of four dimensions” model which developed by Terada in 1998. According to results of the analysis, some challenges of VET in Japan were drawn as follow: Establishing equivalence between general and vocational career path, building qualification framework, establishing and status’s upgrading of higher vocational education, improving secondary vocational education, and integrating system of secondary vocational education among Asian countries for international labor mobility.

KEY WORDS VET in Japan, comparative model for research on VET

Preface

There have been quite few research outcomes on VET in Asian area basing on the comparative method, even though they were researched from the view point of comparison as we could sometimes find some theses or dissertations by Asian students, example in Japan.

The reason why VET researches in Asian area has not developed full-dressed comparative research depends on some Asian research minds and political needs. Asian societies, including Japan and China (mainland), have always expected the development, of course for VET in the sense of Western or east European society, especially the Second World War. Adding to the reason, there is some common historical and cultural tradition in Asian area which maybe has roots in establishment of Chinese bureaucratic system. It’s so-called “school meritocratic society” or “liberal-arts orientation”. The concepts such as calling, occupation and vocation or Japanese “Jitsugyo” have not been developed till later 19th century.

In such situation, Asian and Japanese VET have developed from the needs of economical issue. But, Asian VET has already faced to the new and common phenomena and challenges to solve commonly. So, here, I describe our Asian situation

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of VET, basing my comparative model and focusing on Japanese system, and propose some political and research challenges.

Comparative Model for Research on VET

Starting Point for Methodological Discussion

I think that the starting point of for practical international comparison of VET was opened out by EEC (1963), OECD (Grégoire, R. 1966), and Zabeck, J. (1966) etc. in 1960's to 1970's. These method of comparison depended on the simple "learning cite criterion" and were so pragmatic typology. But Greinert, W. D. (1988,1993) criticized this simple model theory clearly in Germany which was and has been so energetic for international aid of VET through GTZ (Gesellschaft für Technische Zusammenarbeit). He proposed and abstracted three models of VET, market (liberalistic) model, bureaucratic model and mixed (German dual) model, by using one concept or criterion "Regelungsmuster" (regulation pattern).

My one important debt to his analytical model is that he positioned Japanese system as the "market model" as well as ones in US America and UK. I felt that Japanese system didn't depend on only in-company training, but on school bureaucratic system too. There is more differences than communalities between Japanese (Asian) and Western system.

Three Dimensional Analysis

But, just in Germany, other researcher criticized this Greinert's analytical model as simple one (Blossfeld, 1993; Deissinger, 1995; Georg,1995). More multi-dimensional model had to be thought out.

Blossfeld, J. (1993) extracted three aspects, pedagogical, labor market and sociological one, but did not describe in detail about later two aspects. Deissinger, T. (1995) expressed their aspects as organizational, didactical (curriculum) and socialization dimensions and reduced into three "style for VET", job oriented (UK), science oriented (FR) and German Beruf oriented styles. But as the result, this meant reduction into didactical one.

On the other hand, of course, there is one tendency of skepticism to comparison by the unified criterion. For instance, Georg, W. (1995, pp.77-79) said that comparison means one mirror for reflecting of own country's system and provide only quasi-experimental information in specific system context.

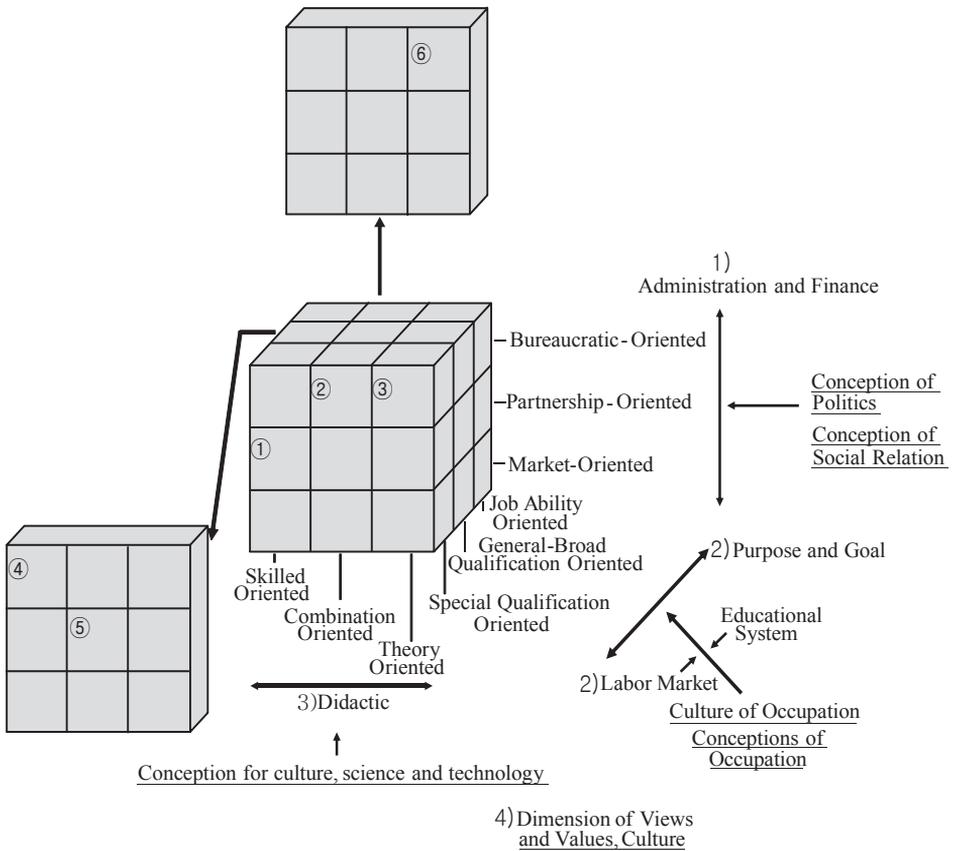
But, if we research about more than three systems (countries), the research objects have always to be analyzed and compared each other by some concept apparatuses, and man can see co-relationship or position relationships among many systems.

Model for Two Historical Axes and Three or Four Dimensions

Depending on such multi-dimensional approaches, I made up and developed the following model (Fig.1 and Fig.2) which is called as "two historical axes and three or

four dimensions for analysis of VET” (Terada, 1998 and 2000). First, multi- four dimensions, such aspects as administration, aim and relevance to labor market, pedagogical (curriculum) and consciousness are set. Secondly, sub apparatuses are prepared for the more detailed analysis within each dimension. Thirdly, we position each sub-system for VET in each country into these places (box). Finally, total historical development of VET is considered in two aspects, school educational development and industrial one.

So, here, I analyze and explain Japanese system and situation of VET, basing on comparative approach.



- ① German Vocational Training
- ② German Special School
- ③ German Vocational School
- ④ Japanese Vocational Ability Development Facility
- ⑤ Japanese Vocational Special School
- ⑥ Japanese Vocational Course at Upper Secondary Level

Figure 1. Three or Four Dimensions for Comparison of Vocational Education

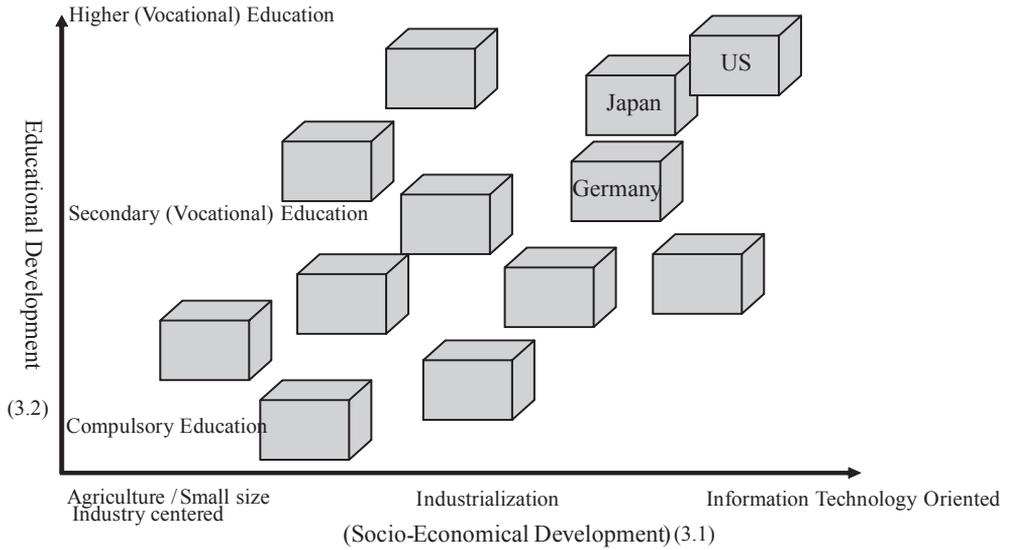


Figure 2. Two Historical Axes for Comparison of Vocational Education

Demographic Situation within VET Sector (Historical Developing Level)

Universalization of Higher Education

General educational demography is as follows (Monbu-Kagaku Shō, 2010).

98 percent among 1.22 million JHS graduates enter HS. 72 percent among all HS students (3,360 thousand), are enrolled into general, 20 percent vocational and 5 percent comprehensive HS. 54 percent of HS graduates enter universities, 23 percent enter specialized schools (not named as colleges and 94 percent are private schools), 16 percent enter employment and 7 percent of them have nothing for career (they become to so-called “Free-ter” or “NEET” to which are later referred to them).

In total 778 (86 national, 90 prefecture and other many private) universities, there are 2.837 million students (incl. 0.27 graduate courses), 35 percent of them belong to colleges of social science, 16 percent to college of technology and 15 percent to college of human science (Monbu-Kagaku Shō. 2010).

Higher Vocational Education

Generally, we can say that so-called “upgrading phenomenon from secondary to post-secondary or higher vocational education” have already been able to observe since 1970’s in Japan, and recently more clearly. In China, by the revised law of VE in 1996,

in Korea by the Law of Higher Education, sector of vocational education had already embedded into higher education sector too.

These reformative measures are common tendency in East Asian area. But, in Japan, comparatively much more vocational high schools' graduates get jobs after graduation than for instance in Korea, although major of new comer in labor market had been surpassed by university graduates. Still, 200 thousands graduates, especially many technical high school graduates can take their jobs in bigger stable companies (Fig.3). That is one Japanese characteristic in the field of VET or labor market for graduates in East Asian area.

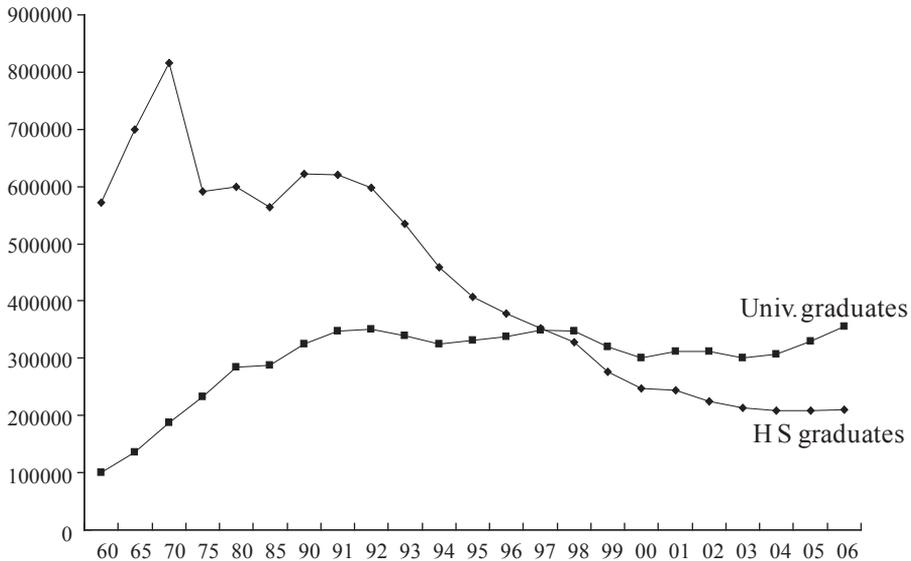


Figure 3. Comparison of Job Placement by School Graduation

Source: BIBB-Fachkongress. Forum x. Arbeitskreis x.

Note: Drawing up from the Gakkô Kihon Chôsa by Monbu-Kagaku Shô.

Administration and Finance of VET (1st dimension)

Regulation Pattern for VET

Contrastively to such Greinert's indication as Japanese VET is liberalistic and in-company training oriented, it is ensemble of school VET and in-company training which complements the former successively. Basing on school basic training, Japanese company is energetically to train and complete the new comers (school graduates) so they can work as company member as fast as possible. Though it has relationship to the next issue, curriculum structure, sharing relationship between VET and in-company training is described as "serial model" or "mixed model by market and bureaucratic ones" as the following Figure 4 (Terada, 2008, p.13)

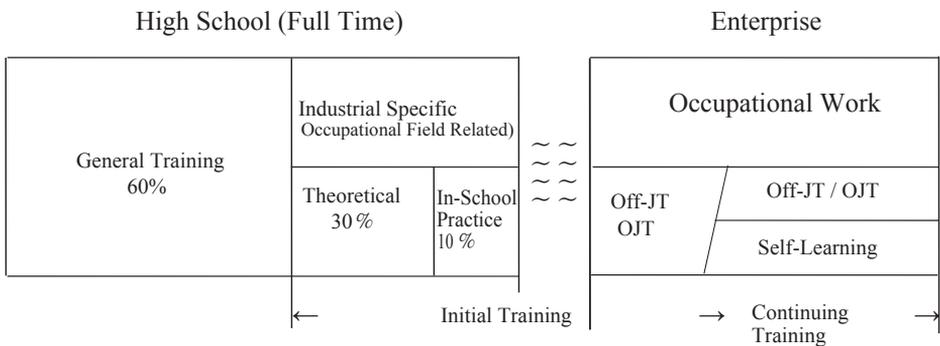
Centralized and Bureaucratic Regulation

Anyway, the part of school VET is strongly controlled by Ministries, not decentralized. This characteristic is not applied only to Japan, but to Korea, China and Taiwan too. In Japan, only in-company training is only so systematized.

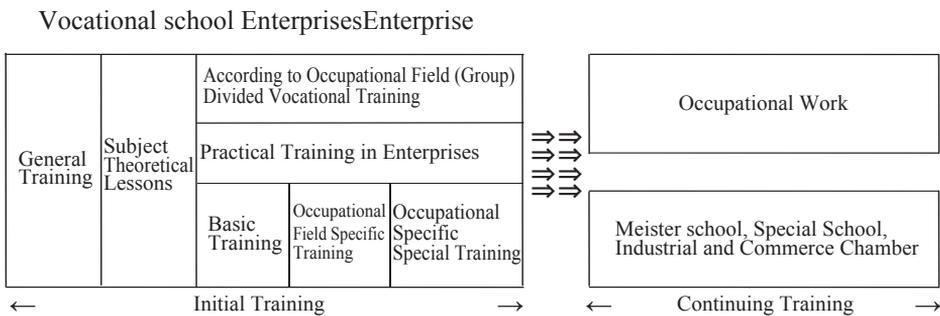
Adding to its administrative character, we have one famous financial aid act for VET.

Especially, “Industrial Education Promotion Act” was founded in 1951 and has supported to school vocational education for sixty years. It has functioned to enforce administrative competence and at the same time to establish Japanese vocational education. Also, textbooks, excluding practical learning, are restricted to only national examined ones.

But, recently, government tends to reduce this special promotion subsidy because of financial reason and decentralization policy.



(a) Japan: Serial Model



(b) Germany: Parallel (or Dual-) Model

Figure 4. The Process of the Competency (Career) Formation: Two Models

Curriculum Structure of VET in Vocational High Schools (2nd dimension)

Loose and Successive Complementary Relationship between School and Company

School vocational education including higher technical colleges and junior colleges (two years colleges) are fundamentally not occupation oriented, but industry branch oriented or academic specialty which corresponds to it oriented. Therefore, curriculum structure is academic and theory centered as we can see from showed above in the modeled figure for vocational high schools. In the case of technical high schools, only 40 to 50 percent among total units for three years are assigned to specialized courses. In the case of commercial high schools, only 25 to 30 percent of total units are assigned to vocational courses. Other courses, of course, are used to general and academic subjects. This thought is maybe same as in other Asian countries.

More characteristic issue of Japanese VET is that school VET doesn't organize the practicum in factories and offices like as normal and Western style VETs. That is so interesting international characteristic, but it derives from the Japanese labor market custom, especially to new comers. There is the famous Japanese in-company training system in its background. In this point, there is one divergence in Asian area, especially between China and other countries.

Recent Measures

Recently, since 2004, Japanese ministry of Education has tried to introduce so-called "Dual system of Japanese version" which combines school training with the practical learning in company (Fig.5) as well as Korean government has introduced quite same school type which named as "Meister-school" since round same year. This education practices are tried in about 20 prefectures, 25 schools. It's so important vocational education movement including "internship education" which has introduced since later 1990's, although it is quite small sized attempts. In Japan, we can see one model shift from Japanese to Western or German model in VET (Terada, 2008, p.15)

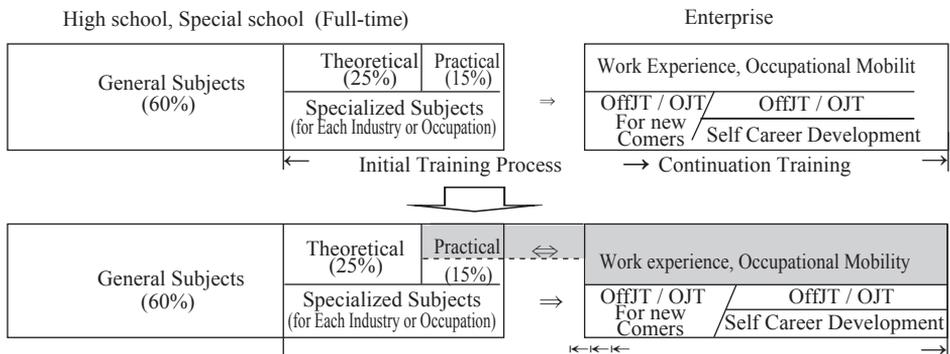


Figure 5. Recent Curriculum Structure

Transition from VET to Working Life and Job Placement System (3rd dimension) : Closed Relationship from Studying Semester Stage between School and Specific Company

Japanese Mechanism in Organizational Transition

Contrastively to the loose relationship between both sides in curriculum structure, it's so near from semester stage in transition relationship of job placement as Fig. 6 shows (Terada, 2008, p.4.)

According to Japanese revised job safety law since 1949, school principals (including universities) can provide not only vocational or career guidance, but also job placement service. Originally, of course, job placement service was not provided by school side, but by vocational counselor in job safety, when new law was approved in 1946 as well as Western method. Maybe, this style can't be said as Japanese, but rather Asian one as well as for instance in Korea. Anyway, school job placement service is so curious international unique practice.

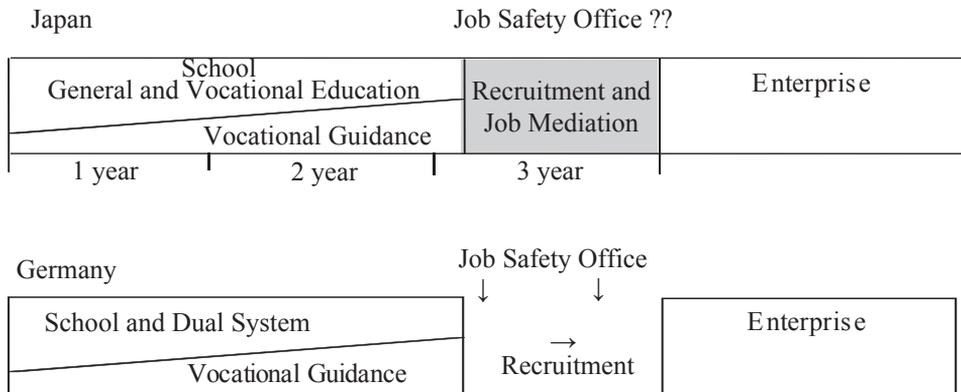


Figure 6. Organizational Transition Process in Japan and Germany (Job Placement): Terada's Comparative Model

Basing on this Japanese recruitment system for new graduates, Japanese companies have developed themselves and secured their work forces stably. This system has depended on so socialistic style, such several elements as national simultaneous examination for company employment (usually in September 16th), only one chance to taking examination for each student, school allocation according to students' academic achievements, continuing sender- recipient relationship between school and company etc.

Anyway, this Japanese system has functioned till recent year consistently. Junior high school graduates had been the major group in this system till mid-1960's and high school graduates had functioned as major new comers till later 1990's. But, university

graduates have become the main sources of new graduate labor market since 1998. With this event and other important changes in labor market, typical Japanese job allocation system is changing gradually.

Interesting Fact in Career Statistic and Recent Problems

The interesting fact concerning Japanese labor market for high schools' graduates is that general courses (high schools' graduates) is most major in comparison by each courses. The number of graduates who can take jobs is round 58 thousands and 40 percent among total graduates who enter employment. The number of technical students is round 48 thousands.

Table 1
Career after Graduation of High Schools in March, 2010 (Provisional Data)

Career Courses	University	Specialized school	Employment	Others, jobless	Total (%)
General	63.1	14.1	7.5	15.3	776,735 (100.0)
Agricultural	15.6	24.8	47.9	11.7	27,522 (100.0)
Technical	18.8	15.7	57.1	8.4	84,429 (100.0)
Commercial	28.6	25.3	37.1	9.0	71,964 (100.0)
Fishing, marine	17.5	13.4	58.6	11.5	2,893 (100.0)
Home-economics	25.8	27.0	34.9	12.3	14,304 (100.0)
Nursing	80.8	10.7	6.0	2.5	4,273 (100.0)
Information technology	44.8	26.8	20.5	7.9	645 (100.0)
Social care	18.2	22.9	49.0	9.9	3,020 (100.0)
Others	68.2	10.4	5.4	16.0	33,124 (100.0)
Comprehensive	37.0	25.6	24.7	12.7	49,383 (100.0)
Total	54.3	15.9	15.8	14.0	1,068,292 (100.0)

Source. 2010b. Gakkô Kihon Chôsa, Heisei 22 Nendo (Sokuhochi). http://www.mext.go.jp/b_menu/toukei/chousa01/kihon/kekka/k_detail/_icsFiles/afieldfile/2010/12/21/1300352_1.pdf

Recent tendencies in Japanese employment market for younger generation including new graduates was first privatization or individualization of vocational consciousness, and secondly fore-sending (moratorium) of formation for vocational competencies with “universalization” of higher education (over 75 percent of high school graduates enter Higher Education), minorlization of job seeker after HS (round 16 percent), thirdly expansion of graduate’s jobless, not exception for VHS graduates too and fourthly

expansion of job stopping within three years after employment (graduation), so-called “7,5,3 or “7, 5,4” phenomenon”. Each number such as 7, 5, 3 means that 70 percent of new employee after graduation stop their permanent job within three years.

Concretely, there are two notable facts. One is that it’s becoming so difficult to take jobs when students graduate excluding technical students by pressure from university graduates and the hard labor market. As the result, many high school graduates can’t take full-time jobs and become to “free-ter” or “NEET” (Fig.7). The ward “free-ter” means one mixed Japanese which combined English “free” (not permanent) with German “Arbeiter” (worker) and “NEET” has a root of usage in United Kingdom which means younger people who have not job, but don’t enter further education (Not in Employment, Education or Training) .

Moreover, there are more job stoppers within three years after employment in the case of the general high schools’ graduates than vocational students as Figure 8 shows (Mie-Ken Shōkō Kaigisho, 2008, p.9). But, regrettably, vocational graduates are not exemption of its cases.

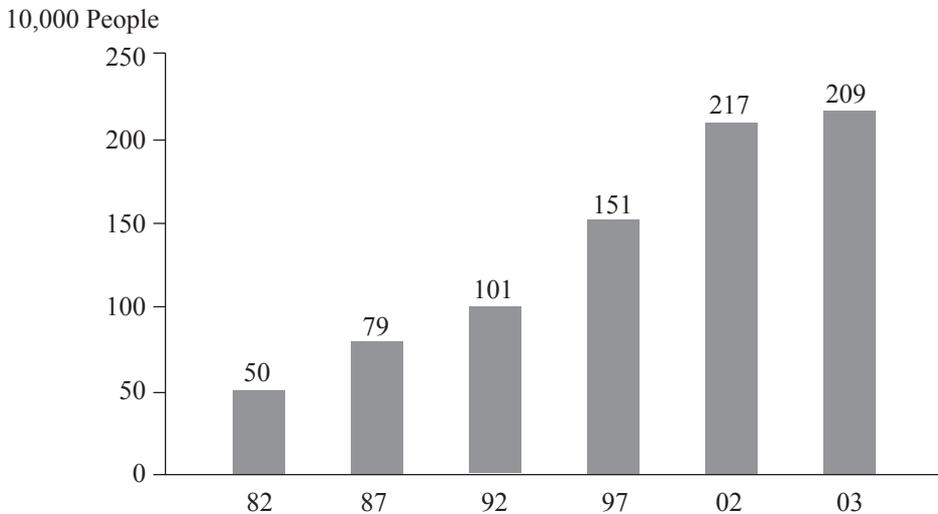


Figure 7. Increase of “Free-ter”

Source: <http://shingakunet.com/career-g/data/data/20050401-13.pdf>

Note: This is based on the analysis of labor economy of Ministry of Health, Labour and welfare in 2004. In regard of 1982, 1987, 1992, 1997, 2002, is quotes from the analysis of labor economy in 2003. Working Conditions Policy Division of MHLW totaled up the labor force survey in the bureau of statistics. Because of the difference of defining Free-ter, it can't consider in line with the documents of Free-ter in 1982 to 1997, 2002, 2003.

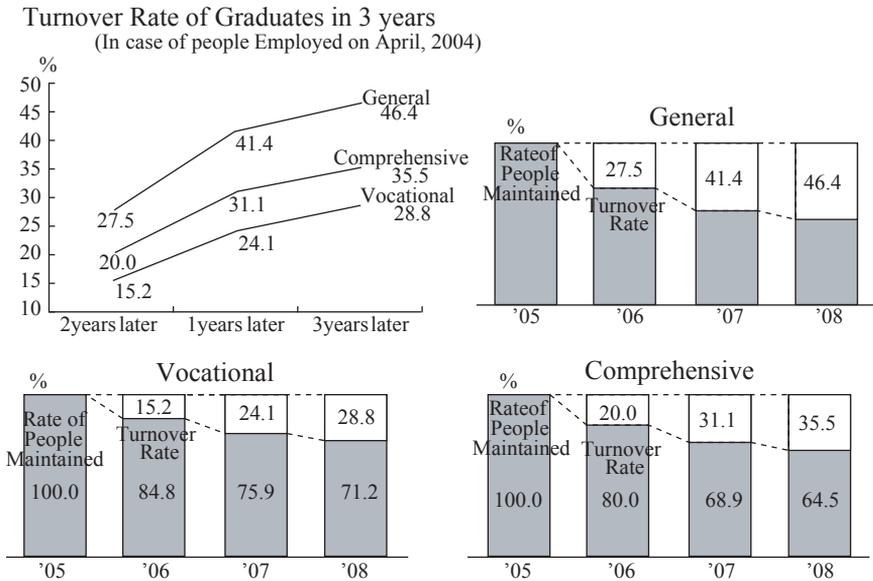


Figure 8. Turnover for Each HS in the Case of Mie Prefecture

Conclusions: Common in Asian Countries?

Extracted problems for vocational education system in Japan and in Asian countries more or less look like common challenges, although each country’s situation of each problem is varied.

- a) We have discussed only the specialized trainings in vocational schools or vocational training facilities. But, clearly, we have to enlarge our concept of VET, at least vocational education, to another major younger generation in general high schools. In Japan, Ministry of Education has tried to enlarge comprehensive high school since 1996 so many students who have nothing to prepare for vocation can take some vocational subjects selectively. Also, so many efforts have been done for career education to general students too. The key measure for both attempts is establishment of equivalence between general and vocational career path.
- b) For the issue, we need an equivalent education and training qualification framework through secondary to higher education level. It guarantees equivalence between academic, general and vocational or professional from same competency criterion. We have to learn from efforts in EU (EQF) or UK (NQF).
- c) Basing on these extensive reformations for VET, firstly, establishment and status’s upgrading of higher vocational education should be hurry, especially in Japan in which vocational education has been still within secondary or simply post-secondary field.
- d) Moreover, intensively, secondary VET should be improved from the view point of 7-2 mentioned above, of quality guarantee of VET.
- e) Finally, measures such as b) to d) prefer Asian international attempt to domestic level, because our international labor mobility is so high and each country, for

instance not only Japan, but also China and Korea have already become recipient of foreign students.

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A Survey and Analysis of the Status of Enterprises' Participation in Vocational Schools' Practical Teaching

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ABSTRACT Practical teaching plays a key role in the quality of talent training in vocational schools, and deep participation of enterprises in practical teaching is the effective guarantee of educating skilled talents with high qualities. This paper employing questionnaires has made an intensive study of purposes, methods and main issues of school-enterprise cooperation in practical teaching, and then suggestions on prompting school-enterprise cooperation in practical teaching are proposed.

KEY WORDS enterprises, vocational schools, cooperation, practical teaching

Background

Vocational education is one of educational types closest to economy circles. Enterprises' participation in vocational education is the effective guarantee of educating skilled talents with high qualities. Practical teaching not only plays a decisive role in talents' education in vocational schools, but also is a key area of the cooperation between enterprises and schools.

In order to educate skilled talents who meet enterprises' needs, the traditional mode of talent education must be changed and elements related to enterprises should also be introduced. That is, enterprises must participate in vocational schools' education of talents. In recent years, China has issued many guidance policies to motivate enterprises to participate in vocational education. Although these policies only encourage people without any legitimate constraints, they still direct and boost the development of enterprise-school cooperation. Under such a background, circumstances of enterprises' participation in vocational schools' practical teaching have aroused people's attention.

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Main Issues

This study mainly focuses on the following points: purposes of practical teaching of the cooperation between vocational schools and enterprises; main forms of school – enterprise cooperation in developing practical teaching; internal influences of enterprises' participation in practical teaching; main problems that both sides encounter in their cooperation and external supports that enterprises expect in the process of their participation in practical teaching, etc.

Methods

The methods of this study are mainly based on questionnaires, with interviews and literature review as supplements. On the basis of the issues mentioned above, some vocational schools and enterprises in Liaoning Province have been surveyed. The interviewees in vocational schools include administrative staff of teaching, directors of practice and professional teachers; the interviewees from enterprises are composed of HR management staff, staff from the section of operation and management and practice-training directors.

The number of questionnaires issued to vocational schools is 103 with 100 usable responses, with the response rate of 97%. Among all the vocational schools surveyed, 81.4% of them are wholly government-sponsored, 11.6% are partly government-sponsored and 4.7% are non-government-sponsored.

The number of questionnaires issued to enterprises is 52 with 52 usable responses, with the response rate of 100%. From the perspective of ownership of these enterprises, 96.2% are state-owned, 3.8% are non-government-owned; from the perspective of size, 51.9% are large-sized enterprises, 46.2% are medium-sized and 1.9% are small-sized. SPSS is used to statistically analyze the data from the questionnaires.

Conclusions

Purposes of Practical Teaching in the School-Enterprise Cooperation

As to vocational schools, to improve employment rate is the primary purpose of the cooperation.

The study on the questionnaires issued to vocational schools shows that the purposes of cooperative teaching are diversified (53.5% with the answer of “to improve employment rate”; 32.6% with the response of “to improve quality of teaching”; 23.3% with the reply of “to improve quality of teachers” and 4.7% with the feedback of “to improve the conditions of school running”); the most direct and primary purpose is to solve problems of students' employment.

Table 1
Purposes of Vocational Schools' Cooperation with Enterprises

Purposes of Cooperation	Proportions(%)
To improve employment rate	53.5
To improve quality of teaching	32.6
To improve quality of teachers	23.3
To improve the conditions of school running	4.7

Vocational schools have the tasks to educate workers with high quality and to educate skilled talents for economic circles. One key indicator to measure the level of running a vocational school is whether the graduates can find a job smoothly, which is also one major element in attracting more new students. Therefore, to solve employment problems has become the primary purpose of vocational schools' cooperation with enterprises.

As to enterprises, to select qualified workers is the main purpose of their participation in the cooperation.

The results of questionnaires issued to enterprises show that the purposes of their cooperation with vocational schools are also diversified (75% with the answer of "to select qualified workers"; 65.4% with the answer of "to improve quality of on-the-job training"; 38.5% with the answer of "to publicize the enterprise"; 32.7% with the answer of "to satisfy the demands of temporary or special projects"; 21.2% with the answer of "to acquire the school's technical support" and 11.5% with the answer of "to get the cheap labor"). Among those, the most direct purpose is to select qualified workers.

Table 2
Purposes of Enterprises' Cooperation with Vocational Schools

Purposes of Cooperation	Proportions (Enterprises, %)
To select qualified workers	75.0
To improve the quality of on-the-job training	65.4
To publicize the enterprise	38.5
To satisfy the demands of temporary or special projects	32.7
To acquire the school's technical support	21.2
To get the cheap labor	11.5

From the results, we can see that the purposes of enterprises' participation in the cooperation are based on their own interests to get qualified workers, to improve their staff's on-the-job training quality and to publicize their own businesses. Meanwhile, to satisfy demands for temporary and special projects, to get vocational schools' technical support and to get cheap labor force are also the starting point of their participation in the cooperation. These demands are objective. To vocational schools, such purposes are not really "pure", but they do form the fusing point of the cooperation.

The lower HR cost in enterprises, the smaller waste, the more profit they will earn. On one hand, enterprises need workers with high quality; on the other hand, they expect

to limit the cost to the minimum level as possible. Therefore via the cooperation with vocational schools, on one hand, enterprises can employ excellent talents directly from those who exercise as interns in them, thus saving much cost of employment and on the other hand, enterprises can earn a great many interns who provide them with adequate and cheap labor force, which, to some extent, reduces the HR cost of enterprises. All those meet the economic interest of enterprises.

Vocational schools expect to recruit as many graduates as possible from enterprises and enterprises also wish to have excellent graduates, but the choice of enterprises is based on their own reasonable employment size. If enterprises do not need many workers, the purpose of their cooperation with vocational schools is probably to get cheap labor force via short-term training. However, when they need many workers, their cooperation probably aims to select qualified workers. These constantly changing demands determine the different motivations of enterprises' participation in practical teaching in different periods.

The graduates, after post practice (to go to enterprises to practice the skills learned in schools), have a higher signing rate, and the overall first-time employment situation is good.

In the view of the motivation of the cooperation between schools and enterprises, to solve student employment is the primary purpose of vocational schools' cooperation with enterprises; while to select qualified workers is the first purpose of enterprises' participation in schools' practical teaching, but how could the employment of those after post practice in enterprises possibly be?

The survey on enterprises shows that 50% of the total enterprises surveyed respond that the signing rate of those after post practice will be over 80%, 37.5% of the enterprises believe the rate up to 50% at least. Furthermore, the survey on vocational schools also supports such a conclusion: 62.5% of the schools surveyed hold that the signing rate of those after post practice will be over 80%. From the results, we can see that the first-time employment situation in vocational schools is good, but the employment rate is not up to approximately 100% publicized in the Internet or newspaper.

Table 3
The Signing Rate of Students after Post Practice

Signing Rate	Proportion (Enterprises, %)	Proportion (Schools, %)
>80%	50	62.5
>50%	37.5	17.5
>30%	6.25	7.5
>10%	6.25	12.5

Main Forms of Practical Teaching in the Cooperation between Schools and Enterprises

The questionnaires on vocational schools show that the forms of enterprises' participation in the schools' practical teaching are diversified. The five cooperative

forms are listed as follows: “post practice in enterprises” (77%), “practical teaching in schools” (57%), “practical teaching in enterprises” (45%), “cooperatively establishing practice bases or labs in schools” (33%) and “cooperatively developing curriculums or textbooks” (20%). The survey on enterprises shows similar results: “post practice in enterprises” (66.7%) ranks the first, with the others followed: “practical teaching in schools” (61.1%), “practical teaching within enterprises” (55.6%), “cooperatively developing curriculums or textbooks” (33.3%) and “cooperatively establishing practice bases or labs within schools” (11.1%). We can see from the survey results that both sides have a consistent judgment on the cooperative forms and both sides believe that post practice in enterprises is the main form. However, to set up practice bases in schools, to develop curriculums or textbooks, and other forms of cooperation are not very popular, which shows that the depth and width of the cooperation are still unable to satisfy the need of practical teaching.

Table 4
Main Forms of Practical Teaching Developed by Schools and Enterprises

Forms	Proportions (Schools, %)	Proportions(Enterprises, %)
Post practice in enterprises	77	66.7
Practical teaching in schools	57	61.1
Practical teaching in enterprises	45	55.6
Cooperatively establishing practice bases or labs in schools	33	11.1
Cooperatively developing curriculums or textbooks	20	33.3

Practical teaching aims to elevate students' vocational skills, to train their professionalism and to standardize their vocational ethics. In order to achieve such goals, on one hand, the environment of practical teaching should be as close to the actual production environment as possible and on the other hand, the content of practical teaching should, as far as possible, reflect enterprises' typical working content, working modes and production processes. Although many vocational schools have established simulated teaching environments or have adopted the teaching mode integrating both practice and theoretical teaching, these methods cannot replace post practice in enterprises in training students' vocational skills. Compared with practical teaching in schools, post practice within enterprises is a method closer to the actual production, which not only helps students acquire post knowledge and skills, but also helps students accumulate the experience of cooperation with others in actual work, develop good work habits, professional integrities, quality awareness and so on. Therefore, the development of teaching in schools can by no means replace the dominance of post practice in enterprises in practical teaching.

Internal elements influencing enterprises' participation in vocational schools' practical teaching

Surveys on enterprises show that the internal elements influencing enterprises' participation in vocational schools' practical teaching, according to the proportions in descending order, are: business executives' emphasis (76.9%), employment size of enterprises (75%), operating status of enterprises (71.2%), dependence degree of the industry on skilled workers (67.3%) and relevant HR alteration (23.1%).

Table 5
Internal Elements Influencing Enterprises' Participation in Vocational Schools' Practical Teaching

Elements	Proportions (%)
Business executives' emphasis	76.9
Employment size of enterprises	75
Operating status of enterprises	71.2
Dependence degree of the industry on skilled workers	67.3
Relevant HR alteration	23.1

Those results illustrate that executives' emphasis and employment size of enterprises are the two key internal elements influencing enterprises' participation in vocational schools' practical teaching. In the case of lack of relevant laws and regulations, business executives' emphasis is the prerequisite of the school-enterprise cooperation. Meanwhile, employment size of enterprises is the objective basis of practical teaching, which, to a large extent, determines the content and form of the cooperation and at the same time, decides the scale of the students educated in vocational schools. Therefore, vocational schools, in the process of practical teaching, are supposed to adequately consider employment size of enterprises: if the demand for employees descends, the number of the enterprises that the school cooperates with needs to be expanded and more cooperative channels should be developed; If the demand ascends, more students should be recruited to satisfy the demands of enterprises. In the meantime, vocational schools need to adjust their specialty planning according to the changing enterprise demands, so that the fitness to the changing positions in enterprises can be kept well.

At the same time, it is worth noticing that although vocational schools can obtain the information on what kind of workers cooperative enterprises want to employ, it is hard for them to know the changing demands of the whole industry and the demands in certain areas. All the information can be acquired via industry associations, departments of economic management and statistics bureaus, in which the educational administrative departments should play a coordinating role and serve vocational schools with adequate information.

Main problems appearing in the practical teaching of school-enterprise cooperation

Sluggish enterprise demands are the main problem that vocational schools are faced with in the practical teaching.

Results of questionnaires issued to vocational schools show that the problems vocational schools encounter in the practical teaching of school-enterprise cooperation are diversified. The ranks of proportion are listed as follows: "sluggish enterprise demands for workers" (54%), "lack of funds in practical teaching" (45%), "incomplete

practical conditions in schools” (42%), “competence of professional course teachers hardly meeting the teaching demands” (37%), “part-time teachers from enterprises lacking in teaching skills” (34%), “injuries and accidents of students in their post practice” (20%) and so on.

We can see from the above that business demands dominate in practical teaching, which is the key to restricting the quality of practical teaching; while running conditions of schools, such as funds, training conditions in schools, are still greatly restricting the quality of practical teaching held by vocational schools and enterprises corporately; and teachers play a very key role in practical teaching: insufficient capacity of professional course teachers, low-education of part-time teachers in enterprises, and poor level of professional theory have become major constraining factors. Some injuries occurred in the internship, as a gap in the law, is always an unavoidable problem in practical teaching. Some problems about relationships between students and enterprises in cooperative practical teaching, determinations of accident liabilities, disputes on burden-sharing issues have no clear provisions of law, which have become an important factor restricting enterprises' participation in practical teaching.

Table 6
Problems Encountered by Vocational Schools in the Cooperative Practical Teaching

Problems	Proportions(%)
Sluggish enterprise demands for workers	54
Lack of funds in practical teaching	45
Incomplete practical conditions in schools	42
Competence of professional course teachers hardly meeting the teaching demands	37
Part-time teachers from enterprises lacking in teaching skills	34
Injuries and accidents of students in their post practice	20

Conflicts between practice or training and production are main problems in cooperative practical teaching; inadequate service of policies and poor practical conditions are also key factors influencing practical teaching.

The surveys on enterprises indicate that the first three biggest problems that enterprises meet with in practical teaching are “influences of practice or training on production order” (28.57%), “inadequate service of policies” (23.81%), “lack of funds and equipment” (21.43%).

Table 7
Biggest Problems Encountered by Enterprises in Practical Teaching

Biggest Problems	Proportions
Influences of practice or training on production order	28.57%
Inadequate service of policies	23.81%
Lack of funds and equipment	21.43%

The above shows that the conflict between practical teaching and production is a contradiction greatly influencing enterprises' attitude to the cooperation. By cooperating with vocational schools in practical teaching, enterprises can acquire qualified workers and cheap labor force; meanwhile, they have to put in some cost, like planning workers to act as practice instructors, arranging practice time, equipping production facilities for practice, etc. From the perspective of balance of payments, the income of enterprises may be greater than expenditures. Nonetheless, the cost of enterprises occurs exactly when the practice happens, and can be calculated, but the profit of participation in practical teaching can only be seen after a period of time and is also invisible so that it is not easy to calculate. Therefore, although participation in practical teaching brings some income to enterprises, they would not like to because the normal production order will be affected when they accept student interns. Additionally, during students' post practice, some invalid waste of materials or production time may occur, or some losses may arise, thus influencing production efficiency, all of which are not what enterprises want to bear.

Inadequate service of policies is another main problem that enterprises encounter in practical teaching. That indicates that the government has not played a valid guidance and promoting role in school-enterprise cooperation. Policies are external conditions to ensure that the cooperation go smoothly because some fundamental issues cannot be solved by themselves only, for example, the rights and responsibilities of both sides in the legal sense (including the rights and responsibilities of the teachers engaging in further training in enterprises, rights and responsibilities of students in enterprises, treatments of training instructors dispatched by enterprises in schools and admittances of their qualifications into schools ,etc); allocations of the cost of practical teaching; incentives of cooperative teaching for enterprises, etc, all of which should be regulated by the government in the way of policies and laws.

External support that enterprises expect when participating in practical teaching

Surveys on enterprises show that enterprises expect to get support from financial subsidies (59.6%), media publicity (44.2%), direction of the industry association (42.3%) and tax relief (40.4%), among which financial support ranks the first.

Table 8

External Support that Enterprises Expect When Participating in Practical Teaching

External Support Expected	Proportions(%)
Financial subsidies	59.6
Media publicity	44.2
Directions of industry associations	42.3
Tax relief	40.4

The results manifest that when participating in vocational schools' practical teaching, enterprises, on one hand, expect to obtain economic compensations from government's financial subsidies and tax relieves, to lower the cost of practical teaching, and on the other hand, they wish to get directions from industry associations and improve their popularity by the media. The support from the media publicity works directly.

Enterprises' devotion in education is a deed of public welfare, which can help enterprises establish such images: strong economic foundation, emphasis on staff, great vision, which can make the public prefer their products, and therefore to strengthen the publicity of enterprises' participation in vocational schools' practical teaching is good for them.

Suggestions

Suggestions to the Chinese Government

Amend relevant provisions on enterprises' participation in vocational education in Vocational Education Law as soon as possible.

Firstly, clarify the rights and responsibilities of enterprises and vocational schools in practical teaching. To clarify these rights and responsibilities in Vocational Education Law is the most significant way to solve problems in the cooperation, which firstly makes them understand each other's responsibilities well, and makes each perform one's own functions; secondly, it ensures torts in the cooperation to be punished and to guarantee both interests. Meanwhile, it is significant to the settlement of intractable problems in the cooperation like insufficient motivation of enterprises to participate in practical teaching.

Next, clarify standards of financial subsidies in enterprises' participation in practical teaching, especially subsidies to small- and medium-sized enterprises. It is found out in this survey that enterprises' greatest demand for external supports is national financial subsidies, which indicates cost sharing of enterprises and schools is the key and fundamental issue in practical teaching. As a result, government departments, particularly local governments, should prompt drawing up standards of enterprises' participation in vocational schools' practical teaching, form a system of cost sharing with regional features, compensate for enterprises' losses because of practical teaching, and alleviate the burden enterprises bear in practical teaching.

Strengthen the publicity of enterprises' participation in vocational schools' practical teaching by radio, TV, the Internet and other media.

Enterprises' participation in vocational schools' practical teaching is a deed of public welfare. Surveys show that enterprises' emphasis on publicity is second to that on financial support. Therefore, our government needs to value the publicity of enterprises' participation in vocational schools' practical teaching by the use of radio, TV, the Internet and other media. Besides, our government should confer an honorary title like "socially-beneficial enterprise award" and material rewards to typical ones in practical teaching to improve their popularity and sense of identity in enterprises' participation in vocational education.

Establish training centers of cross-enterprise vocational education to compensate for the demand for post practice in practical teaching when there is no much demand.

We know from the survey that post practice in an enterprise is the main form of practical teaching. Reduced demands of enterprises for workers have an inevitable

impact on practical teaching in vocational schools and the qualities of talent training. To solve this problem, we can learn German experience of training centers of cross-enterprise vocational education. These centers are quite similar to enterprises, but their main function is teaching service. The centers should be possibly based on a city as a unit and be classified by main professional categories, and specially take vocational schools' post practice as their task. Teaching facilities and environment should generally keep pace with enterprises, while salaries and funds of staff are offered by national and local financial departments and meanwhile, part of the funds can also be accumulated by taking some projects.

Suggestions to Vocational Schools

Adjust specialty planning to adapt to the demands of the development of local economy and industry.

The survey shows that employment size of enterprises is the objective fundamental of school-enterprise cooperation in practical teaching. Therefore, the adjustment and establishment of vocational schools' specialties should be taken into adequate consideration of local social and economic developmental planning, the industrial developmental trends and the upgrading and adjustment of industrial structures, to form a professional layout meeting the changing demand of labor force market, to improve enterprises' interest in participation in cooperative education.

Elevate the capacity of social services and provide high quality social services.

In order to improve enterprises' enthusiasm for participation in practical teaching, vocational schools should offer more scientific and educational trainings for cooperative enterprises, including selecting excellent teachers to participate in enterprises' product innovations and technical upgrading; offering workers with different professional and technical trainings, based on demands of enterprises' development, to attract enterprises to participate in the cooperation.

Suggestions to Enterprises

The benefits vocational schools provide enterprises with in school-enterprise cooperation are mostly skilled talents with high quality. That means that the degree of enterprises' emphasis on talents needed determines their willingness and initiative to cooperate. Firstly, enterprises must realize that talents are the most important resource of their existence and development, the cultivation of reserve talents should be brought into medium- and long-term development plans of enterprises. Secondly, enterprises must realize that the cooperation ensures their priority to effectively recruit excellent reserve talents. After cooperating with vocational schools, enterprises can train a batch of reserve talents who are familiar with manufacturing procedures and technical requirements for posts and greatly agree with enterprises' corporate culture and developmental strategies. Enterprises can avoid recruiting workers in employment markets, thus reducing employment cost.

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The Relationships among Innovative Culture, Organizational Learning, Commitment to Change and Support Behavior for Change in Meister School

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ABSTRACT The purpose of this study was to examine the relationships among the variables of innovative culture, organizational learning, commitment to change and support behavior to change in Meister School. The population used for this study consisted of Meister School teacher. 371 out of 400 questionnaires were returned, of which 359 were used for analysis after data cleaning. Data analysis was accomplished using SPSS for Window 15.0 and AMOS 7.0. The major findings of this study were as follows: The culture aimed at innovation gives a positive effect on the commitment to change, commitment to change gives a positive effect on the support behavior for change, the innovative culture and the organizational learning give indirect effect on the support behavior to change through the commitment to change.

KEY WORDS Meister School, innovative culture, organizational learning, commitment to change, support behavior to change

Introduction and Background

Meister Schools are emerging to response to a rapidly changing society. The teachers who are leading the Meister School play a very important role in order to respond to changes. However, it has been mentioned as a problem that the teachers have little interest of participation in the change process. Therefore, support behavior to change and commitment to change are a key factor if these schools can be successful (Leithwood, Janti & Steinbach, 1999). These schools can be successful when the change occurs to individual as well as an organizational culture.

The present study investigates the relationships among innovative culture, organizational learning, commitment to change and support behavior to change of teacher in Meister School.

In the next section, the theoretical background and the conceptual framework are

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presented, and a set of testable hypotheses is proposed. Methods of the study are then introduced, which include information about the sample, study measures, data analysis, and test results. Following a discussion of the results, implications are offered.

Theoretical Background

The Meister School is a type of vocational high school grown as a "high school diversified 300 Project" by the current government. The purpose of the Meister School is to present the vision and the future to vocational students depending on skills and competencies that they want to grow as a professional in the field. The main contents of the policy are established Meister School career path, Meister education regulatory reform, support of national development (Ministry of Education, Science and Technology, 2008). In 2008, 9 schools, in 2009 12 schools have been designated, now a total of 21 schools are selected and operated.

Innovation culture is a type of culture to create new business and is always acquiring resources for growth that to respond impact and changes with creativity and development (Quinn & Kimberly, 1984; Lee, 2007). In innovative culture, there are strongly apparent characteristics like the development of new ideas and open interaction, adventure and challenge, fast and flexible business processes. The attributes of innovative culture include entrepreneurship culture, creativity, adaptability, dynamism, challenge, and it can be stimulated to innovate and increase performance (Dellana & Hauser, 2000; Zammuto & Krakower, 1991; O'Neill & Quinn, 1993).

Organizational learning means to change the cognitive structure and behavior through the direct or indirect learning at the organizational levels in order to improve the ability to cope with the environment that face the organization. The process and configuration factors of organizational learning are being set with the difference between the perspective and the theory. Particularly, the study focused on the learning of organizational level presents the model of organizational learning around processing that based on the organization to acquire new knowledge and to share the process of generalize (Argyris et al., 1978; Huber, 1991; Lam, 2001; Pawlowsky, 2001; Shaw & Pekins, 1991; DiBella & Nevis, 1997).

Commitment to change can be defined as teachers who want to run and absorbed when the school's goals matches own goals as well as beliefs, and to accept the change in the process of changing (Leithwood et al., 1999). Commitment to change means the power that is required to connect a series of actions of individuals to successful change in the organization (Herscovich et al., 2002).

Support behavior for change is conceptualized as the result of change commitment and behavior change, which makes individual sacrifice and effort for the success of change (Lee, 2007; Herscovitch & Meyer, 2002).

Support behavior in organizational change is divided into three kinds of actions: compliance, cooperation, championing (Herscovitch & Meyer, 2002). Commitment to change was conceptually separated from organizational commitment (Fedor, Caldwell

& Herold, 2006; Ford, Weissbein & Plamondon, 2003; Herscovitch & Meyer, 2002) which was found to be a predicting variable of support behavior for change (Herscovitch & Meyer, 2002; Ford, Weissbein & Plamondon, 2003; Fedor, Caldwell & Herold, 2006). Innovative culture affects to the commitment to change, because it can accept the change, improve the learning, and reduce the burden of failure (Slater & Narver; 1995; Marquardt & Reynolds, 1994; Lee, 2000).

Overall, derived from the theoretical background, the framework in Figure 1 is established. Therefore, a model of innovative culture, organizational learning, commitment to change and support behavior to change will be examined, and each hypothesis will be tested in this research.

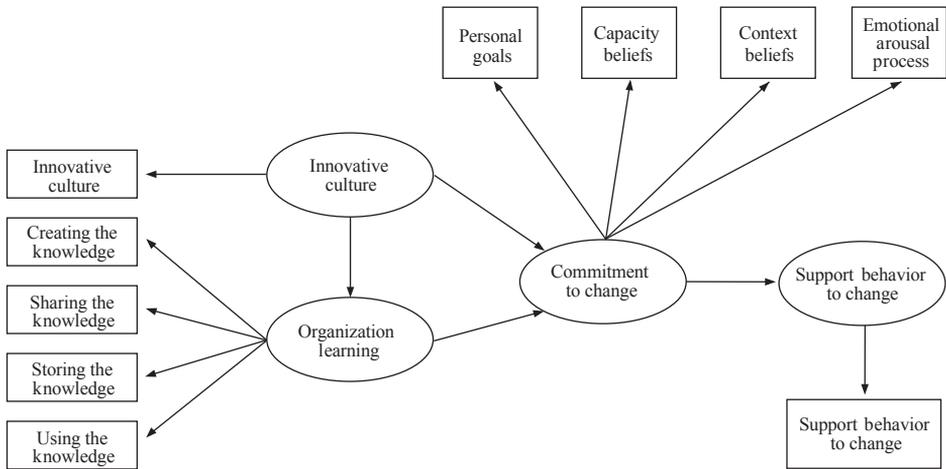


Figure 1. Hypothetical Model

Methods

Population and Sampling

The population of this study was 1,384 teachers who work in 21 Meister Schools. Meanwhile, according to Krejcie & Morgan (1970) if these teachers are to be the population, the sample should be over 302 teachers. In this study, to consider the return rate and insincerity answer, 400 teachers were sampled.

400 surveys were distributed randomly to teachers in 16 Meister Schools. 371 surveys were returned, for a response rate of 92.8% 359 surveys were deemed usable, as 12 teachers did not complete the survey sincerely.

Instrumentation

An innovative culture was based on Cameron and Quinn (1999)'s OCAI (Organizational Culture Assessment Instrument). Organizational learning is composed of 4 factors(Creating the knowledge, sharing the knowledge, storing the knowledge, using the knowledge) and 22 items which were originally from Lee (2007). Commitment to change is composed of 4 factors(Personal Goals, Capacity Beliefs, Context Beliefs, Emotional Arousal Process) and 16 items which were originally from Yu et al. (2002). Support behavior to change was based on championing which is a part of Herscovitch & Weyer's(2002) instrumentation. It is composed of 6 items.

Factor loading of innovative culture was 0.499~0.768, organizational learning was 0.495~0.722, commitment to change was 0.498~0.722, support behavior to change was 0.663~0.817. Cronbach's α of innovative culture was 0.811, organizational learning was 0.928, commitment to change was 0.866, support behavior to change was 0.878.

Table 1
Characteristics of Instrumentation

Variables	Item	Factor Loading	Cronbach's α
Innovative culture	6	.499 ~ .768	.811
Organizational learning	22	-	.928
Creating the knowledge	5	.579 ~ .731	.778
Sharing the knowledge	6	.677 ~ .777	.871
Storing the knowledge	4	.528 ~ .790	.760
Using the knowledge	7	.495 ~ .710	.824
Commitment to change	16	-	.866
Personal goals	4	.498 ~ .628	.635
Capacity beliefs	4	.619 ~ .678	.733
Context beliefs	4	.568 ~ .672	.710
Emotional arousal process	4	.564 ~ .722	.711
Support behavior to change	6	.663 ~ .817	.878

Note: n = 359

Data Collection and Analysis

The data were collected by mail between December 15, 2009 and December 27, 2009. Of the 400 questionnaires sent out, 371 surveys were returned (92.8%). A total of 359 were used for final analysis, except 12 who didn't answer or insincerely answered. Data analysis was accomplished using SPSS for Window 15.0 and AMOS 7.0.

Data Collection

To receive opinions about the desired curriculum for Hallim technical high school according to the conceptual framework for analysis, we used a workshop with the teachers, interviews, and review of the literature as our method. Two rounds of interviews were done. In the first round, the head of the graduate association, 5 people

with ties to industrial bodies, people with ties to the Office of Education, the vice-principal, the principal, 13 teachers, 2 staff members, and 5 students were all interviewed. In the second round, 7 teachers and the director were interviewed. Also, a workshop for 71 teachers was done by dividing them into groups of nine. Next, to get a grasp on the present condition of the curriculum, students, teachers, and people with ties to industrial bodies were surveyed. The collected material according to each item is shown in Table 3.

Findings

Characteristic of Variables

Mean, standard deviation and mean (5-point) of the variables are presented below in table 2. The average of innovative culture was 3.49, organizational learning was 3.59~3.61, commitment to change was 3.56~3.79 support behavior to change was 3.67.

Table 2
Descriptive Statistics of Variables

Variables	Range	Mean	SD	Mean (5-Point)
Innovative culture	6-30	20.96	3.309	3.49
Organizational learning				
Creating the knowledge	5-25	18.53	2.503	3.71
Sharing the knowledge	6-30	21.72	3.277	3.62
Storing the knowledge	4-20	14.36	2.186	3.59
Using the knowledge	7-35	25.17	3.278	3.59
Commitment to change				
Personal goals	4-20	15.16	1.900	3.79
Capacity beliefs	4-20	14.69	2.254	3.67
Context beliefs	4-20	14.24	2.253	3.56
Emotional arousal process	4-20	14.75	1.876	3.69
Support behavior to change	6-30	21.99	3.307	3.67

All correlations within each variable are strong and significant ($p < 0.01$) indicating that they are closely aligned. The result of analysis about skewness and kurtosis to test a normality, the absolute value of skewness was below 0.701, the absolute value of kurtosis was below 1.601. So this study assumes normality.

Table 3
Correlation Matrix and Normality

Variables	1	2	3	4	5	6	7	8	9	10
1)Innovative culture	-									
2)Creating the knowledge	.415**	-								
3)Sharing the knowledge	.490**	.642**	-							
4)Storing the knowledge	.502**	.464**	.603**	-						
5)Using the knowledge	.520**	.662**	.710**	.629**	-					
6)Personal goals	.473**	.418**	.350**	.355**	.413**	-				
7)Capacity beliefs	.444**	.453**	.438**	.359**	.459**	.525**	-			
8)Context beliefs	.649**	.429**	.453**	.406**	.466**	.504**	.636**	-		
9)Emotional arousal process	.371**	.522**	.416**	.372**	.495**	.435**	.501**	.431**	-	
10) Support Behavior to Change	.472**	.422**	.420**	.407**	.483**	.528**	.524**	.555**	.584**	-
Skewness	-.594	-.086	-.701	-.234	-.301	-.415	-.638	-.438	-.136	-.389
Kurtosis	1.601	.639	1.596	.743	.712	.468	1.390	.742	.163	.975

Verification of Hypothetical Model

In order to evaluate structural equation model, overall goodness-of fit of this model should verified first. χ^2 was 133.652 (df=32 p=0.000) which is not acceptable. But, it is not desire to evaluate the fitness of a model based solely on χ^2 if data set is not normally distributed or size of sample is large.

In absolute Fit Index, GFI was 0.930, AGFI was 0.882 which is in the acceptable range. In proposed Model, NFI was 0.921, CFI was 0.944, IFI was 0.944 which is in the acceptable range. In parsimonious Fit Index, PNFI was 0.681 which is in the acceptable range. So, the hypothetical model was identified suitably.

Table 4
Fit Index of Hypothetical Model

	Acceptable Range	Proposed Model	Interpretation
Absolute Fit Index			
χ^2	p > .05	133.652 (df=32 p=0.000)	-
RMSEA	< .08	.093	-
GFI	> .90	.930	Fit
AGFI	> .85	.882	Fit
Incremental Fit Index			
NFI	> .90	.928	Fit
CFI	> .90	.944	Fit
IFI	> .90	.944	Fit
Parsimonious Fit Index			
PNFI	> .60	.681	Fit

The result of path analysis of variables is table 5, figure 2. All proposed relationships are significant. The coefficient of the path from innovative culture to commitment to change is .372, from organizational learning to commitment to change is .510, from innovative culture to organizational learning is .603, from commitment to support behavior to change is .742.

Table 5
Path Analysis of Variables

Type of Path	Estimate ^{a)}	S.E.	C.R.
Commitment to change ← Innovative culture	.372	.033	6.542***
Commitment to change ← Organizational learning	.510	.057	7.575***
Organizational learning ← Innovative culture	.603	.037	11.188***
Support behavior to change ← Commitment to change	.742	.401	12.260***

Note 1: a) Standardized Regression Weight
 Note 2: *** p < .01 ** p < .05 * p < .10

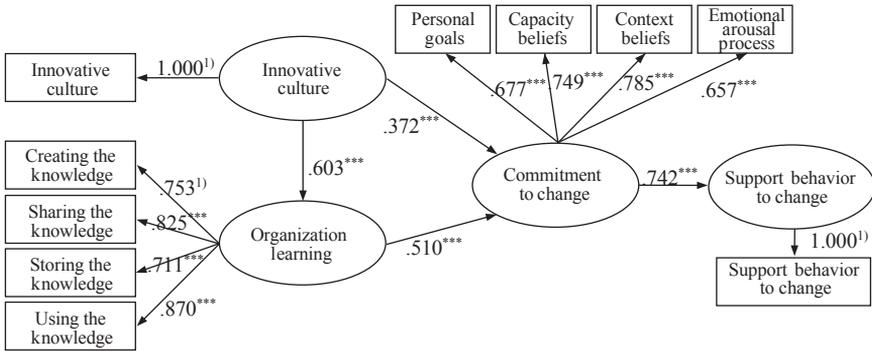


Figure 2. Verification of Hypothetical Model

Note 1) Fixed parameter
 * significant at p<.01, ** significant at p<.05, *** significant at p<.001

In relationship between innovative culture and commitment to change, organizational learning had a moderation effect of 0.308(0.510 * 0.603)

All proposed effects are significant. Direct effect from organizational learning to commitment to change is 0.510, from innovative culture to organizational learning is 0.603, from commitment to change to support behavior to change is 0.742. Indirect effect from innovative culture to support behavior to change is 0.504, from organizational learning to support behavior to change is 0.379.

Table 6
Effect Decomposition

Type of Path	Direct Effect	Indirect Effect	Total Effect
Commitment to change ← Innovative culture	.372***	.308***	.679***
Commitment to change ← Organizational learning	.510***	-	.510***
Organizational learning ← Innovative culture	.603***	-	.603**
Support behavior to change ← Commitment to change	.742***	-	.742**
Support behavior to change ← Innovative culture	-	.504***	.504***
Support behavior to change ← Organizational learning	-	.379***	.379***

Note: *** p < .01 ** p < .05 * p < .10

Discussion and Implications

First, the culture aimed at innovation gives a positive effect on the commitment to change. Also, innovative culture gives an indirect effect on the personal commitment of change through organizational learning to facilitate the sharing and implementation of change. It means that a supportive organizational culture is needed to settle Meister School which is the existing vocational high school as the changed type, as well as individual efforts in the process of pursuing change. Also it means that organizational learning can be done actively in an innovative culture and through these organizational learning, and it is possible to strengthen commitment to change by sharing information and changing the atmosphere. So, it needs to promote the culture which can accept changes to establish the school system as a Meister School. And It is expected to provide various formal and informal opportunities between members of the organizations to learn about change.

Second, commitment to change gives a positive effect on support behavior for change. It means that motivation is needed to accept the change in order to obtain the participation of each individual. Therefore, in order to meet the new school system, it should provide the motivation that teachers feel themselves the needs for change rather than the delivery of services for simply changed the system. To do this, it is planned to run workshops and seminars targeted all the teachers, or providing various incentives for excellent teachers.

Third, innovative culture and organizational learning give indirect effect on support behavior to change through commitment to change. In order to raise support behavior to change, an individual of organization as well as the member belong to organization makes the atmosphere to accept and share the change.

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Present Status of and Strategy for the Development of Human Resources among the Youth of Miyagi Prefecture: Focusing on Public Vocational Training

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ABSTRACT This paper discusses a survey of prefectural occupational training facilities in pursuit of their current conditions: In particular a developmental training for youth conducted at these facilities grasping the coordination with localities and relationship with political policy of training. The objective of this paper is to search for a new direction of policy development including coordination with educational institutions.

KEY WORDS human resources development, vocational training, Miyagi prefectural governments, Japan

Introduction

The objective of this study is to investigate and analyze the present status of policies regarding the Development of Human Resources (DHR) among the youth of Miyagi Prefecture, a principal area of the Tohoku Region, and to investigate future strategies.

Academic education and employee education are often cited as broad interpretations of DHR. However, focusing on public vocational training, this study will analyze the relationship between DHR and political policy while surveying DHR mechanisms and look to guide prospects for DHR in the future.

The objective of this study originated from the degree of public perception toward vocational training. Though the portion of vocational training in Japan pertaining to unemployment policies is generally well known, the same cannot be said for the developmental training of post-secondary education, closely related to educational institutions, and the skill-upgrade training embodied by recurrent education of the employed. Thus, this study aims to broadly publicize Miyagi Prefecture's vocational training, to broaden understanding of the relationship between vocational training and the education and industrial fields, to raise awareness of the importance of vocational training and to contribute to encouragement of its increased utilization.

Under the above outlined contexts, we conducted a survey of prefectural vocational

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training facilities in order to understand their current conditions. Looking in particular at developmental training aimed at youth conducted at these facilities, we will search for a new direction of policy development that includes collaboration with educational institutions while at the same time grasping said training's collaboration with localities and relationship with political policy.

The structural outline of this study, which elucidates the above issues, will be as follows. Section 2, as an analysis of the present state of affairs, will present an outline of vocational training in Japan and will explain which portion of this outline is undertaken by the public vocational training being carried out in Miyagi Prefecture. It will also define the relationship between academic education and vocational training. As fieldwork, Section 3 will present the content of our survey of the Miyagi Prefectural Sendai Vocational Training School. Section 4, will address topics arising from the survey as well as new courses of action that should be taken in the future.

Research Problem

Vocational Training System

Vocational training held at public vocational training facilities is divided into a variety of formats and is traditionally classified into the following three areas.

1. Vocational Training for the Employed: Referred to as "Improvement Training," includes training of currently employed laborers in new, or higher-level skills/techniques.
2. Vocational Training for the Unemployed: Referred to as "Aptitude Redevelopment Training," includes training of the unemployed, or people who have just started new work, who have been instructed by a Public Employment Security Office to receive training in new skills/techniques.
3. Vocational Training for Youth: Referred to as "Development Training," includes training of new graduates aiming to cultivate skilled laborers through accumulation of proficiency.

However, with a change in the Human Resources Development Promotion Act in 1995, the training system was altered from division by trainee classification to division by the level of skills/techniques offered. The new system is now divided into two categories, "Advanced Vocational Training" (vocational training to help workers attain high level skills and knowledge necessary in their occupation) and "Ordinary Vocational Training" (all other vocational training not included in Advanced Vocational Training). In addition, a system of division by intervals was also added. The current system includes "Normal Course," "Short-term Course," "Specialty Course," "Short-term Specialty Course," "Applied Course," and "Short-term Applied Course."

By focusing on public vocational training targeting youth, this study will highlight and advance debate on Normal Course, Ordinary Vocational Training that we will refer to in terms of division as "Developmental Training."

Vocational Training Facilities

In accordance with the Human Resources Development Promotion Act, the burden of establishing vocational training facilities in order to conduct such vocational training as outlined above is charged to the state and prefectural governments. Article 15-6 provides for the following 5 types of facilities.

Polytechnic schools.

Facilities for providing long-term and short-term training courses for ordinary vocational training.

Polytechnic colleges.

Facilities for providing long-term and short-term training courses for advanced vocational training.

Polytechnic universities.

Facilities for providing long-term and short-term training courses for advanced vocational training and long-term training courses specified by an Ordinance of the Ministry of Health, Labor and Welfare as those for advanced vocational training for developing and improving specialized and practical human resources.

Polytechnic centers.

Facilities for providing short-term training courses for ordinary or advanced vocational training.

Polytechnic schools for persons with disabilities.

Facilities for physically or mentally disabled persons who have difficulty in receiving vocational training at facilities listed in items 1 to 4.

According to Article 16, of the aforementioned, establishment of 2 to 5 is the burden of the state, and establishment of 1 the burden of the prefecture, while additionally it is also possible for 2 to 5 to be established by the prefecture, and 1 to be established by municipalities. Those facilities which are established by the state are managed by the Employment and Human Resources Development Organization. However, according to the Ordinance for Enforcement of the Human Resources Development Promotion Act, management of 5) Polytechnic Schools for Persons with Disabilities, is entrusted to the Employment of the Elderly and Persons with Disabilities Organization and to prefectural governments.

In accordance with regulations outlined above, the following vocational training schools have been established in Miyagi Prefecture.

The vocational training school used as the subject of this study is a public polytechnic facility established by the prefecture as per Articles 15-6 and 16 of the Human Resources Development Promotion Act. Though legally it is defined as a Polytechnic School, facility names are ordained by prefectural ordinance, and thus may

not cohere exactly in terms of title.

Table 1

Table of Training School in Miyagi Prefecture

School Name	Outline
Sendai vocational training school	General curriculum serving a central role in the prefecture
Shiroishi vocational training school	IT curriculum located in the southern region
Osaki vocational training school	Manufacturing curriculum located in the northern region
Ishinomaki vocational training school	Manufacturing curriculum located in the eastern region
Kesennuma vocational training school	Service curriculum located in the north-eastern region
Miyagi vocational school for the disabled	Curriculum focusing mostly on office work for disabled persons

Relationship with Academic Education

The contents touched upon up to this point have concerned the vocational training system under the jurisdiction of the Ministry of Health, Labour and Welfare. It is sufficient to say that there are qualification and institutional divergences between this vocational training system and the academic education system under the jurisdiction of the Ministry of Education, Culture, Sports, Science and Technology, which in a broad sense is also classified as DHR. This is to say that while generally speaking both fall under the same system of DHR, academic education consists of scholastic qualifications, whereas vocational training consists of vocational qualifications outside of the scholastic field.

With graduation from high school as the branching point of the divergence between these two systems, a disparity of qualification between those who have and do not have an academic record later develops between those whom progress to academic educational institutions such as colleges and those whom progress to vocational training. Herein lies the malady of such vertically integrated administration systems; vocational training is not included within the recognized framework of post-secondary education.

However, from a DHR standpoint, there is an inevitable connection between all academic and industrial fields, including vocational training, and it goes without saying that there is a demand for programs that encompass the whole. Amid such a backdrop, it is believed that progressively defining the significance of vocational training will be an important issue in the future. This topic will again be addressed in the conclusion of this survey.

Research Findings

Miyagi Prefectural Sendai Vocational Training School

The Miyagi Prefectural Sendai Vocational Training School (Hereafter “Sendai

School”) was established in 1964 by integrating three facilities located in Sendai City, the engineering technology vocational training facility, woodwork vocational training facility and Sendai vocational training facility. Today it is the backbone of the five advanced technologies vocational schools in Miyagi and employs integrated coursework.

Though vocational training facilities must reevaluate their course subjects based on social needs, they also afford consideration towards the segregation with academic educational institutions and organize their own original subject matter. The Sendai School is no different and to this day has continued to update its subject matter based on contemporary needs.

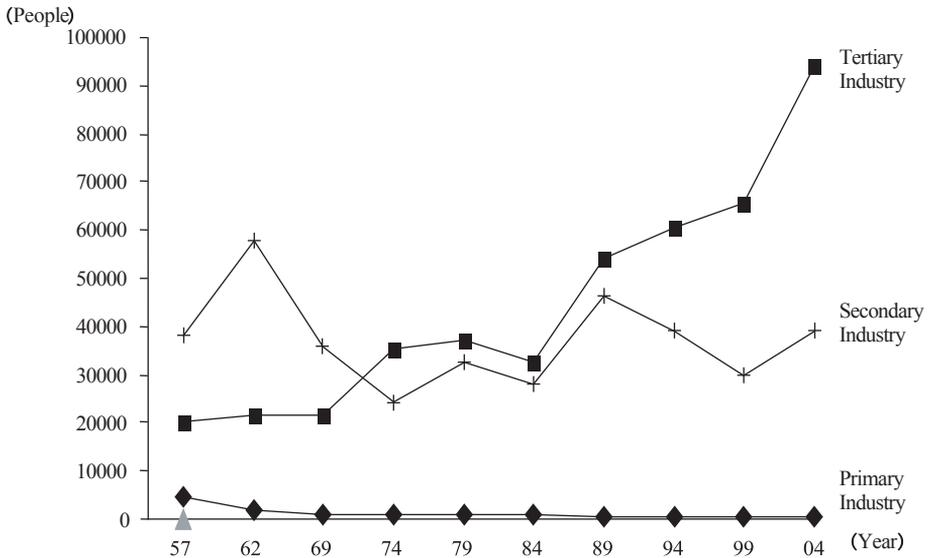


Figure 1. The Transition in Primary Demand to Employees

Looking at the evolution of subjects over time, around 1958, when the Vocational Training Act was established, both primary demand for employees and subject matter focused mainly on secondary industry, thus contributing to the supply of human resources. However, in later years the primary demand for employees switched to tertiary industry Figure 1, while the school maintained subject matter centered on secondary industry. Though certainly details within subject matter were adjusted to conform to the demands of society, the core focus on secondary industry remained unchanged.

Though at a glance the subject matter of vocational training facilities could be seen as having their own original style that does not correspond to society’s needs, one can see the division of roles by comparing said subject matter with that of academic institutions.

Figure 2 shows the transition of graduates from special training schools in Miyagi over time. Special training schools are educational institutions run by private

organizations aiming to develop abilities necessary for work or for daily-life. The courses listed are all classified as tertiary industry. Though not displayed in this image, there is also a manufacturing-related component to tertiary industry included in the survey's "statistical yearbook" which is broken down into automobile mechanics, information processing and electronic computers.

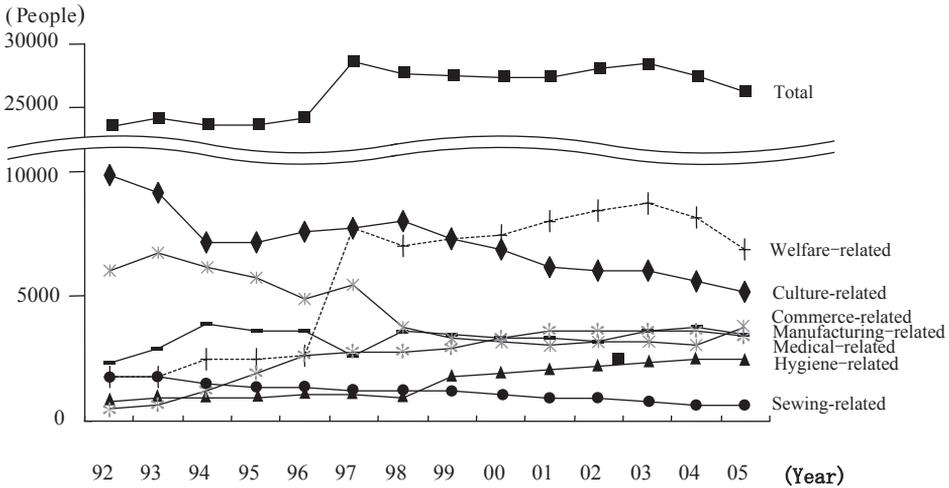


Figure 2. The Transition of Graduates from Special Training School

Looking at this diagram it can clearly be seen that DHR in the tertiary industrial field is undertaken by the special training schools of private educational institutions, and though there is a degree of redundancy among training courses, largely there is little necessity for public vocational training facilities in this field. In Miyagi's case especially, the large number of special training school graduates in comparison with other prefectures gives rise to segregation between academic institutions and occupational training institutions. It is thus fair to say that the prefecture takes responsibility for the portion of facilities investments requiring financing, such as machinery and electrical construction for secondary industry, a field difficult for private academic institutions to enter. Taking all of this into account, we will now look at the present organization of courses at the Sendai School.

Developmental Training for Youth

Students

In regards to the condition of applications for training courses, while popular courses, such as the "Automobile Mechanics Course," receive three times the number of

applications than the enrollment limit, there are also courses for which the number of applicants does not exceed this limit. Overall the average number of enrollees is approximately 80% of the enrollment limit.

Among students enrolled in 2008, over 80% were 17 to 20 years old and about 90% were Miyagi natives. Also, among courses with subject matter focusing mainly on secondary industry, students coming from Technical High Schools made up only 12% of the whole; many students came from other academic disciplines. Additionally, a small number of college students and specialized vocational school students were also enrolled. The school boasted a high rate of post-graduate employment; in 2007 the employment rate of persons who had completed training was 93.7%, with 80% of those finding work within Miyagi Prefecture.

Courses

Currently at the Sendai School, there are 2-year (For students who have graduated from high school or higher) and 1-year Normal Course training courses, as well as Short-term Courses for the unemployed, those who have just started new work, or those who have graduated from junior-high school. These courses are outlined below.

Table 2

Table of Courses Geared toward Youth at the Sendai School

Training Period	Course Name	Enrollment	Reference
2 Years	Automobile mechanics	20	(20 People X 2 years normal course)
	Electronic control systems	20	"
	Machinery engineering	15	(15 People X 2 years normal course)
1 Year	Electricity	20	(Normal course)
	Utility work	20	"
	Interior services	10	"
	Architectural drafting	20	"
	Fashion business	20	"
	Workmanship painting	20	"
	Billboard advertising	20	"
6 Months	Architectural painting	10	(Short-term course)
	Plastering	10	"

Currently, one of the more characteristic courses is the “Machinery Engineering” course, established in 2008 to support employment at newly established manufacturing businesses. This course is associated with development of nearby industrial complexes and is extremely closely connected to prefectural industrial promotion policies. It is a revamped course, originating from the “Machinery” course offered just after the Sendai School was established. In 1992 the “Machinery” course was renamed the “NC Machinery” course, which was then reorganized in 1998 and used as a base to create the

“Precision Machinery” course. Finally, in 2008 the course was once more reorganized to create the current “Machinery Engineering” course. This method of reforming and improving the contents of courses to fit the needs of society using human and material resources is a distinguishing characteristic of the Sendai School. This kind of quick adaptability is a feature rarely found in academic educational institutions.

Training

Training lasts from 8:35 a.m. to 3:40 p.m. and is held every day with the exception of Saturdays, Sundays and national holidays (There are also extended cessations of training including summer break and winter break). All training is designed with a mind toward qualification acquisition, including practicums and coursework adapted to each field, and is carried out in practice facilities and classrooms.

According to faculty, school facilities themselves are used as training materials: Sendai School billboards are created by students of the Billboard Advertising course, painting of school buildings is done by students of the Workmanship Painting and Architectural Painting courses, and re-tiling of floor tiles is done by students of the Interior Services course Figure 3.



Figure 3. Interior Services Course

Furthermore, in an effort to raise skill levels, students also enter into various skill competitions. The school displays the work of prize-winning graduates at the World Skills International Competition Figure 4.



Figure 4. The Work of Prize-winning Graduates at the World Skills International Competition

Other Training

In addition to training aimed at youth, the school also positively implements aptitude redevelopment training for the unemployed, or those who have just started new work, and improvement training for the currently employed. These types of training only oblige trainees to pay for the cost of textbooks.

Conclusion and the Role of Human Resource Development in the Future

From this survey, it is clear that vocational training schools are not only unemployment countermeasures known by the general public, but also serve a role as post-secondary education institutions aimed at youth.

In regards to vocational training for youth, vocational schools contribute to the community twofold, by affording youth an opportunity for advancement and work after high school graduation, and by developing human resources to inherit industry. At the Sendai School, the “Machinery Engineering” course has been established to respond to the agglomeration of manufacturing industries within the prefecture, incorporating into the program training contents rooted in regional industry.

Additionally, in regards to the established courses, as previously stated most focus on secondary industry, complementary providing human resources to the industrial arena while dividing roles with academic institutions. However, as the contents of these courses do not necessarily reply to the majority of social needs, they go unbeknownst to the public.

In conclusion, the vocational training school’s social acknowledgment level is low. Nevertheless, this school has greatly contributed to youth DHR in the community.

Amid this kind of vertically integrated administration system, there is an example

suggesting the possible role of DHR in the future which does not segregate academic and vocational training institutions, implemented as a single, amalgamated policy within Miyagi Prefecture.

The key word of this plan is “collaboration.” In the plan, what up until now had been vertical information here is changed to horizontal information, allowing for the communal sharing of information, contributing to the growth of DHR through the sharing of more information.

As for pragmatic efforts, in 2007 the prefecture established the “Miyagi Human Resource Development Platform,” a new section of the Miyagi Prefectural Government Commerce, Industry and Tourism Department, as a means through which to unite high schools, businesses and vocational training facilities and support their collaboration Figure 5.

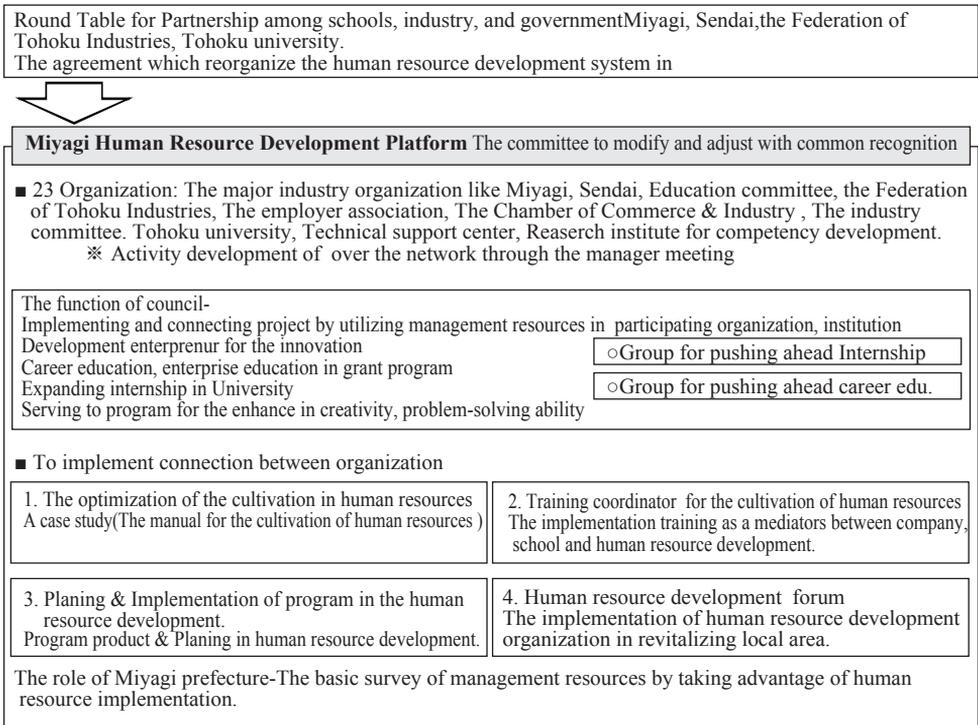


Figure 5. Miyagi Human Resource Development Platform

The source: available from <http://www.pref.miyagi.jp/sanzin/kikaku/pf/whatis.htm> (Miyagi Prefectural Government in Japan: accessed 29 August 2010)

Collaboration is progressing smoothly; efforts put into effect to date include dispatch of highly-skilled technicians (From the Ministry of Economy, Trade and Industry) to technical high schools (Administered by the Ministry of Education, Culture, Sports, Science and Technology) and technical workshops at vocational training facilities (Administered by the Ministry of Health, Labour and Welfare) targeting instructors at technical high schools.

As for future issues, it will be necessary to further expand promotion of collaboration, and specifically from a DHR viewpoint, how to suppress conventional conceptions of vertical administration will be a significant topic which we believe will lead to added significance of vocational training.

Additionally, it will also be necessary to focus on the related area of qualifications. The qualification system in Japan up until now has consisted of either ministries and government organizations or private groups institutionalizing their various qualifications, giving way to a flood of different qualifications. Consequently, for the same type of occupation a number of different qualifications may exist, and without any type of framework for distinguishing their level, they are looked upon as little more than customary traditions. In a world fast-marching in the direction of globalization, it is predicted that a day will come in which an international vocational qualification system is created, disadvantaging the vocational qualifications of Japan. In order to avoid this disadvantage, it is necessary to examine case studies of the forward-thinking efforts of European countries, and for Miyagi Prefecture, while maintaining a base of societal collaboration, to swiftly review possible options.

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A Case Study on Learning Behavioral Styles for the Workers in a Multinational Tire Company in E-Learning Environment

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ABSTRACT The major purpose of this study is to provide the basic pedagogical resources to the general training settings as well as global company Hankook Tire Corporation for designing the optimum teaching and learning environment in e-Learning through the investigation study on the Learning Behavioral Styles (LBS) of the personnel in Hankook Tire Corp who have experienced e-Learning. Subjects were 200 adults who are over the age of 20 and all of them have relevant e-learning experience. Results of 146 out of these subjects' response on the tool have been analyzed, and it showed that there may be differences in Learning Behavioral Styles among the three country groups of subject workers. In a sense of LBS by gender in the company, we understand that there may be no difference in the Learning Behavioral Styles between the female and male group. However, the composition of LBS in gender seems to be somewhat different as the number of EISLBS is the most in female group contrary to the male composition where the number of EISLBS group is less than the number of EDSLBS and PCLBS.

KEY WORDS learning behavioral styles, e-learning environment, global company

Introduction

The world has become a global village with the rapid advancements in information and communication technologies, and the information and communication technologies have changed our way of approaching to education. The role of the information and communication technology in education and training is also being continuously tested today in nations across the world, each with its unique learning environment and culture. As the result, educational design and development in e-learning has been being improved so much in theoretical and practical aspects.

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E-Learning environments are highly affected by technology with an ever increasing growth in educational institutions to the extent that they are becoming very popular in these educational establishments. E-learning Environments are based on a range of delivery and interactive services. These services may consist of many different components, such as: video-conferencing, web-browsers, shared whiteboards, animations and simulations. Bates and Leary (2001) stated that "it is not only important that students are given access to the most appropriate tools and environments that present information in an engaging manner, but that also provide appropriate support for the diversity of individual student learning styles".

"Learning styles," are the result of educational experience, and cultural background. The academic success for any student in any learning environment is influenced by emotional, biological, psychological, and cultural factors. In order to facilitate academic success, it is important to provide learning experiences that are accessible to all students with all learning preferences. "Learning styles" can help to guide students to the study techniques that are most likely to be effective to them. It can give an indication on how students can response to different types of lecture delivery and consequently if they like to approach new material. Students may like to work in small groups, while some may prefer to work individually. On the instructor's side, learning styles can be used to help in enhancing and improving the lecture presentations.

None the less, it is difficult to find research or theses considering individual learning behavior in e-Learning environment. Due to this kind of problem, most of e-Learning programs running by the educational or training settings currently are generally analogous in the structure of instruction-learning activities. Fizzel(1984), James & Galbraith(1985), Dunn(1986), and Matthews(1991) insisted that the scholastic achievements are practically improved when learners' learning styles are considered in the educational environment. Hence, individual learner's learning style must be importantly taken into account especially in the situation of designing individual learning environment. As we have known, the e-Learning environment provides intrinsically individualized learning. Learners learn what they want to learn or what the e-Learning environment induces to. In this sense, it would be more important for us to find out each learner's learning behavioral style (LBS) than to find out the individual learning style especially in the e-Learning environment.

Purpose

The major educational purpose of this study is to provide the basic pedagogical resources to the general training settings as well as global company Hankook Tire Corporation for designing the optimum teaching and learning environment in e-Learning through the survey study on the Learning Behavioral Styles (LBS) of the workers in Hankook Tire Corp who have experienced e-Learning.

Methods

All 200 subjects are from a multinational tire company(Hankook Tire Corp.) in Korea. which is Korea's largest tire company, and they were classified into five regions within three countries, Hankook Tire Korea Corps, Hankook Tire Chinese Corp, and Hankook Tire Hungary Corp. The subjects were adults who are over the age of 20 and all of them have relevant e-learning experience. They were sampled through cluster sampling. The Hankook Tire was established in 1941 as the first tire maker in Korea. Today, the corporation remains the domestic industry leader and serves as a yardstick for measuring how far the industry has developed.

200 subjects were selected with convenience sampling method through out the Hankook Tire Corp which is Korea's largest tire company, and they were classified into five regions within three countries, Hankook Tire Korea Corps, Hankook Tire Chinese Corp, and Hankook Tire Hungary Corp. The Hankook Tire was established in 1941 as the first tire maker in Korea. Today, the corporation remains the domestic industry leader and serves as a yardstick for measuring how far the industry has developed.

The subjects were adults who are over the age of 20 and all of them have relevant e-learning experience. 163 out of the 200 subjects filled out the Learning Behavioral Style questionnaire developed by Choi et al. (2007). The recovery rate was about 81.5%. However 17 out of 163 were excluded because of the insincere responses, so 146 were used for the analysis. The SAS package program was used for the analysis.

The analysis has been conducted with the LBS measuring tool developed by Choi et al. (2007). The measured LBS by the tool can be classified into 4 styles Positive and Cooperative Learning Behavioral Style(PCLBS), Environment Independent and Self-taught Learning Behavioral Style(EISLBS), Environment Dependent and Self-taught Learning Behavioral Style(EDSLBS), Passive Learning Behavioral Style(PLBS).

The each characteristic of learning behavioral styles is as follows.

Style 1. Positive and cooperative learning behavioral style

The characteristic of this learning behavioral style is that learners study autonomously through positive interaction with other learners. They tend to come into close relation with other learners and the instructor and offer their opinion obviously. The learners of this learning behavioral style like to study together with their colleagues, so this style is named "positive and cooperative learning behavioral style."

For the learners of this style, it is necessary to let them make their community for group study or for topic study when designing e-Learning environment, which will make them join in learning spontaneously.

Style 2. Environment-independent and self-taught learning behavioral style

The characteristic of this learning behavioral style is that learners choose and make use of information and evaluate what they learned for themselves. So this style is named "environment-independent and self-taught learning behavioral style."

For the learners of this style, it is necessary to give them much leadership in learning if possible when designing e-Learning environment and to let them lead their own

learning by indicating the lesson goal in detail which is supposed to be achieved by the end of lecture.

Style 3. Environment-dependent and self-taught learning behavioral style

The characteristic of this learning behavioral style is that learners play a leading role for learning. And if they get something they don't understand, the learners of this style interact with and ask the instructor or take advice for the continuous learning activity. They get feedback individually on their learning from the instructor, and they are likely to be affected much by the type of learning design. So this style is named "environment-dependent and self-taught learning behavioral style."

Some e-Learning programs are made to proceed step by step from beginning to end, and learners can't choose some part that they want to study. But for the learners of this style, it is necessary to let them choose what they want to study and always interact with the instructor when designing e-Learning environment.

Style 4. Passive learning behavioral style

The characteristic of this learning behavioral style is that learners have little confidence in themselves and disregard their ability. And they are scarcely motivated to study and refrain from joining in learning. So this style is named "passive learning behavioral style."

For the learners of this style, it is necessary to give them the definite reason for participating in learning and an appropriate motive when designing e-Learning environment.

The Cronbach's Alpha value of each LBS(Total 20 items with 5 items of each) for The instrument is greater than 0.7 which is good enough as the tool reliability (Nunnally, 1978). 5 Likert scale(1: strongly agree ~ 5: strongly disagree) has been used.

The number of expert group for the validity test of the instrument was 16 and the Content Validity Ratio proposed by the Lawshe(1975) for the all items used was more than the criterion, 0.49 for securing the validity(Choi et al., 2007).

Table 1 shows the Cronbach's Alpha value for the measuring tool of LBS in e-learning environment.

Table 1
Reliability by Each LBS in E-learning Environment (Cronbach's Alpha)

Styles	Reliability	Number of Items
Positive and cooperative learning behavioral style	.8165	5
Environment-independent and self-taught learning behavioral style	.6676	5
Environment-dependent and self-taught learning behavioral style	.6841	5
Passive learning behavioral style	.6508	5

Limitation

The sample size is one of major drawbacks for this study. Especially several results of chi-square test for LBS by our discrete independent variables such as gender, country,

age, job, etc. have some cells that have less than 5 counts. That means our chi-square test may not be a strong statistical tool for some of the results. The test results, however, could just be some referral information for the readers. The descriptive table data frequencies also may have many referral information for our study.

Findings

Demographic Data of the Subjects

As we can see below Table 2, 30 female (20.55%) workers and 116 male(79.45%) in Hankook Tire Corp were investigated for the study. About half (47.95% for 70 workers) of the subjects is Office workers and 54(36.99%) were Technical workers including engineers. As the results, most of workers in this investigation for the global Hankook Tire Corp were in official and technical area.

Table 2
Gender by Job

Job	Male	Female	Total
Manager	2(1.37)	2(1.37)	4(2.74)
Office	46(31.51)	24(16.44)	70(47.95)
Sales	6(4.11)	2(1.37)	8(5.48)
Services	8(5.48)	0(0.00)	8(5.48)
Technical	52(35.62)	2(1.37)	54(36.99)
Etc.	2(1.37)	0(0.00)	2(1.37)
Total	116(79.45)	30(20.55)	146(100.00)

Table 3 indicates the number of subject workers in each country within the Hankook Tire Corp. 40(27.4%) of Chinese, 48(32.88%) of Hungarian, and 58(38.77%) of Korean subjects were investigated. Meanwhile, we can find the information data about the subjects' age group and intention about the e-Learning contents whether they would choose the e-Learning contents in their own choice, in other's recommendation, or compulsory choice of e-Learning because of the set schedule.

Table 3
Country by Gender, Age and Choice

Classifications		Korea	China	Hungary	Total	
Gender	Female	4(2.74)	2(1.37)	24(16.44)	30(20.55)	
	Male	54(36.99)	38(26.03)	24(16.44)	116(79.45)	
	Total	58(39.73)	40(27.40)	48(32.88)	146(100.00)	
Age	below20	4(2.74)	0(0.00)	2(1.37)	6(4.11)	
	20s	34(23.29)	26(17.81)	30(20.55)	90(61.64)	
	30s	18(12.33)	14(9.59)	16(10.96)	48(32.88)	
	40s	2(1.37)	0(0.00)	0(0.00)	2(1.37)	
	Total	58(39.73)	40(27.40)	48(32.88)	146(100.00)	
	Choice	My own	42(28.77)	30(20.55)	26(17.81)	98(67.12)
		Recommendation	4(2.74)	2(1.37)	18(12.33)	24(16.44)
Scheduled		12(8.22)	8(5.48)	4(2.74)	24(16.44)	
Total		58(39.73)	40(27.40)	48(32.88)	146(100.00)	

Learning Behavioral Styles by Group(Gender, Country, Age, Job and Choice)

According to Table 4, we may first find composition of the number of our subjects' Learning Behavioral Styles. The most of subjects in the Hankook Tire Corp in this study fall in the EDSLBS(Environment Dependent Self-taught Learning Behavioral Style). From the result ($\chi^2 = 5.9934, p = 0.1119$) of chi-square test for the LBS by gender, we understand that there is no difference in the Learning Behavioral Styles between female and male group. However, the composition of LBS in gender seems to be somewhat different as the number of EISLBS(Environment Independent Self-taught Learning Behavioral Style) is the most in female contrary to the male composition where the number of EISLB group is less than the number of EDSLBS and PCLBS(Positive and Cooperative Learning Behavioral Style) groups.

Table 4
LBS by Gender

Gender	EDSLBS	EISLBS	PCLBS	PSLBS	Total
Female	8 (5.48)	12 (8.22)	8 (5.48)	2 (1.37)	30 (20.55)
Male	48 (32.88)	24 (16.44)	40 (27.40)	4 (2.74)	116 (79.45)
Total	56 (38.36)	36 (24.66)	48 (32.88)	6 (4.11)	146 (100.00)
Statistic			DF	Value	Prob
Chi-Square			3	5.9934	0.1119

From the following Table 5, we may conclude that there is strong difference ($\chi^2 = 83.2576, p = <.0001$) among the three groups of subject workers in China, Hungary and Korea. The interesting findings of the result are that most (79.31%: 46 out 58 Korean workers) of Korean subjects are involved in the EDSLBS, 60% of Chinese subjects are involved in the PCLBS and 41.67% of Hungarian subjects are involved in the EISLBS. We may need further study on this result because we have no back data for the cultural differences.

Table 5
LBS by Country

Country	EDSLBS	EISLBS	PCLBS	PSLBS	Total
Korea	46 (31.51)	4 (2.74)	8 (5.48)	0 (0.00)	58 (39.73)
China	4 (2.74)	12 (8.22)	24 (16.44)	0 (0.00)	40 (27.40)
Hungary	6 (4.11)	20 (13.70)	16 (10.96)	6 (4.11)	48 (32.88)
Total	56 (38.36)	36 (24.66)	48 (32.88)	6 (4.11)	146 (100.00)
Statistic			DF	Value	Prob
Chi-Square			6	83.2576	<.0001

According to Table 6, there seems to be statistically difference ($\chi^2 = 18.3152, p = 0.0317$) between 20s and 30s subject works and ‘Below20’ subject works in Learning Behavioral Styles.

Table 6
LBS by Age

Age	EDSLBS	EISLBS	PCLBS	PSLBS	Total
20s	38 (26.03)	24 (16.44)	26 (17.81)	2 (1.37)	90 (61.64)
30s	14 (9.59)	8 (5.48)	22 (15.07)	4 (2.74)	48 (32.88)
40s	2 (1.37)	0 (0.00)	0 (0.00)	0 (0.00)	2 (1.37)
Below20	2 (1.37)	4 (2.74)	0 (0.00)	0 (0.00)	6 (4.11)
Total	56 (38.36)	36 (24.66)	48 (32.88)	6 (4.11)	146 (100.00)
Statistic			DF	Value	Prob
Chi-Square			9	18.3152	0.0317

According to Table 7, the compositions of Learning Behavioral Styles according to the job classification in the subject workers of Hankook Tire seem to be similar ($\chi^2 =$

23.8054, $p = 0.0685$).

Table 7
LBS by Job

Job	EDSLBS	EISLBS	PCLBS	PSLBS	Total
Manager	0 (0.00)	2 (1.37)	2 (1.37)	0 (0.00)	4 (2.74)
Office workers	18 (12.33)	22 (15.07)	24 (16.44)	6 (4.11)	70 (47.95)
Sales	4 (2.74)	2 (1.37)	2 (1.37)	0 (0.00)	8 (5.48)
Services	4 (2.74)	0 (0.00)	4 (2.74)	0 (0.00)	8 (5.48)
Tech	28 (19.18)	10 (6.85)	16 (10.96)	0 (0.00)	54 (36.99)
Etc.	2 (1.37)	0 (0.00)	0 (0.00)	0 (0.00)	2 (1.37)
Total	56 (38.36)	36 (24.66)	48 (32.88)	6 (4.11)	146 (100.00)
Statistic			DF	Value	Prob
Chi-Square			15	23.8054	0.0685

As below Table 8, the subject workers who have chosen e-Learning contents in their own way are mostly in the EDSLBS. But the subjects who use e-Learning contents through others' recommendation show most of PCLBS. This difference between those two groups (Own selection group and other's recommendation group) might be already determined because the group who have selected e-Learning contents in their own way must learn e-Learning contents by themselves. On the other hand, we could imagine that the group who has chosen the e-Learning contents by other's recommendation would have a tendency of being cooperative.

Table 8
LBS by Choice

Choice	EDSLBS	EISLBS	PCLBS	PSLBS	Total
My own	46 (31.51)	20 (13.70)	28 (19.18)	4 (2.74)	98 (67.12)
Recommendation	2 (1.37)	8 (5.48)	12 (8.22)	2 (1.37)	24 (16.44)
Scheduled	8 (5.48)	8 (5.48)	8 (5.48)	0 (0.00)	24 (16.44)
Total	56 (38.36)	36 (24.66)	48 (32.88)	6 (4.11)	146 (100.00)
Statistic			DF	Value	Prob
Chi-Square			6	14.5856	0.0237

Conclusions

The basic idea of this study is to utilize the Learning Behavioral Styles in e-Learning environment instead of traditional Learning Styles. In e-Learning environment, learners generally what they want to learn or what the e-Learning environment induces to. Hence, it would be more important for us to find out each learner's learning behavioral style than to find out the individual learning style especially in the e-Learning environment.

With this educational philosophy, this study was conducted. Also the researchers had been interested in a global company because the workers in the company are usually consisted of international workers. Therefore we have decided a global company in Korea as a subject company. The Hankook Tire Corp is Korea's largest tire company and the 7th in the world. The company has five regional factories within three countries, Hankook Tire Korea Corps, Hankook Tire Chinese Corp, and Hankook Tire Hungary Corp.

The results showed that there may be differences in Learning Behavioral Styles among the three country groups of subject workers.

In a sense of LBS by gender, we understand that there may be no difference in the Learning Behavioral Styles between female and male group. However, the composition of LBS in gender seems to be somewhat different as the number of EISB is the most in female group contrary to the male composition where the number of EISLB group is less than the number of EDSLBS and PCLBS.

The subject workers who have chosen e-Learning contents in their own way are mostly in the EDSLBS. But the subjects who use e-Learning contents through others' recommendation show most of PCLBS. This difference between those two groups (Own selection group and other's recommendation group) might be already determined because the group who have selected e-Learning contents in their own way must learn e-Learning contents by themselves. On the other hand, we could imagine that the group who have chosen the e-Learning contents by other's recommendation would have a tendency of being cooperative.

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A Conceptual Study about the Order-Oriented Training Mode in Technical Vocational Education and Training

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ABSTRACT The major purpose of this study is to conceptualize the Order oriented (O-O) training mode, and to fulfill the major purpose, we set sub purposes in research process. It is intended to optimize industry-academia cooperation better, enrich the theory connotation, carry skill persons regular for social, and impel the overall reform of technical vocational education and training (TVET).

The main research methods for this study are literature review and interview regarding this subject, and we have put forward several measures to conceptualize the O-O training mode as follows. Firstly, to change the thinking of TVET, to formulate the teaching plan, and to accelerate teaching reform of TVET is the basic guarantee for carrying out the O-O training mode. Secondly, substantial support of enterprise is the basic demand for take part in the O-O training mode. Finally, bring into play the coordinative role and supervisory role of the government and competent departments, and adhere to strategy of sustainable development, to create the good social environment for the O-O training mode.

KEY WORDS Order-oriented (O-O) training mode, TVET, industry-academia cooperation

Introduction

With the development of the world economic integration and all kinds of new applied technologies, different kinds of enterprises need the efficient skill persons who can use the new technology and new equipments in the process of product upgrading and technical innovation. Technical vocational education and training (TVET) that ties up with the industry and the development of economy is the focus of attention for every country government once more.

Industry-academia cooperation is the essence all of TVET training mode. It is widely used in German, Japan and the United States and relevant theoretical system also has more mature.

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In Germany, the dual curriculum system training mode is widely used in secondary and higher technical vocational education. This training mode emphasizes to integrate theory with practice and to cultivate professional ability. The need of the enterprise is the core of the dual curriculum system, and the responsibility of vocational school is to bring up students that the enterprise needs (Deissinger, 1994; Mark, William, Roberta, Mark, & Ute, 1999).

In Japan, in order to improve the efficiency of technical vocational education, enterprises and technical vocational education departments begin to run school jointly, so that to make the training direction more clearly and to be up to the mustard. And this running mode has been recognized by industrial circles in Japan as well as many other countries (Leonard, 1991; Thomas & Christopher, 1998).

In the United States, there is a more flexible way of technical vocational education that is the mode is called Cooperative Education. Students use half the time for learning in vocational school, and half the time for work in the enterprise. In this way, theory can be applied in actual operation, and students can learn more useful knowledge more directly (Leonard, 1991).

When some managers of enterprise try to cultivate the efficient persons more and more to prevent disorder in choosing the efficient persons, and depend on this to obtain the max incomes of efficient persons with the min devotion by using industry-academia cooperation, the Order oriented (O-O) training mode emerge.

The O-O training mode is a new kind of training mode based on industry-academia cooperation. In the process of technical vocational education, the vocational school is based on the need of employ persons department, to constitute the blue print of the training together with the employ persons department.

Simultaneously, they ought to sign an 'Order (namely employment agreement)' with the students who attend the O-O training mode (we called them 'the O-O students'), and to cooperation at the aspect of teacher resource, technology, equipment and so on. The O-O students can get a job into the employ persons department directly after graduation.

That have bring the important effect for the TVET to have changing from the conventional teaching system to modern teaching system, to advance the ability diathesis, technology diathesis, vocational diathesis and to account for the question of the obtain employment for the O-O students.

The O-O training mode is showing its strong vitality, when it appears. The main features include three dimensions as follow.

- Pertinence: The school teaching will be According to the requirements of professional completely.
- Effectiveness: Due to the high pertinence, the knowledge and skills they have learned will be useful simultaneously; it can shorten training time and increase efficiency effectively.
- Forehanded: Due to the high pertinence and effectiveness, thereby reducing the strong training cost and improves the economic benefit.

The O-O training mode is different from 'Authorized training mode', and there is a big conceptual distinction between them. Authorized training is a kind of mode under

the planned economy. Employ persons department apply from relevant education department, and the education department specifies school to training, then students apply for studying and they can get a job from employ persons department after graduation. And on the contrary, the O-O just is a training mode in market economy. Employ persons department negotiate with school directly, and sign an order to reach an agreement; the school's responsibility is to recruit and training for the order, and send him to work to the employ persons department after graduation. And during this period, the government should be more tend to control the society and to improve the country and social economic development, it can help to create a virtuous circle of growth (The World Bank, 1997).

By the way, the paying party is decided by the market situation and social situation. If it is an era of labor surplus, the payer may be students, and if it is an era of labor shortage, employ persons department will pay for all. Sometimes the government may be the paying party in case the trainees are unemployed men. Based on many of TVET modes of experiences like these and after long-term exploration, the O-O is put forward as an effective training mode. It has positive effects for the progress of structure of TVET, the increase of students' vocational skills, competence and quality, and career prospect. In order to embody its positive significance, we give an account of positive significance from the following three aspects.

Firstly, vocational schools would like to face enterprise and market. That is the premise of the O-O training mode, so vocational school is able to determine its own position according to the demand of enterprise and market. Department setting, curriculum arrangement and teaching methods would be based on improving students' professional ability. The O-O training mode is good to improve teaching treatment of vocational school. By way of industry-academia cooperation, communication with zero distance between training course and market demand is not out of the question, and the school is able to use the enterprise resources to improve the teaching level of professional course, and then strengthened the teacher resource faster.

Secondly, according to the 'Order' the tailor-made persons can change the role from student to practitioner perfectly in employ persons department. At the same time, the training expenses and training time can be saved; HRD (Human Resource Development) costs of employ persons department can be reduced. However, even more importantly, enterprise HRD will be more forward-looking and initiative, it can bring an evolution of HRD idea and method. Therefore, enterprise would be more trust TVET, understand the worth, and then it will pay more attention to TVET to realize win-win truly.

Finally, the most direct and obvious benefit of the O-O students will be to get rid of the risk of employment. Because the O-O training mode has opened the way for industry-academia cooperation, the learning zeal of the students is aroused, from 'passive learning' to 'active learning' to lay the foundation for further.

However, there are many problems between vocational school and enterprise when the O-O training mode running. For instance, the unpredictability of the enterprise development, the strongly utilitarian of the enterprise operation, and even the unstable

mental characteristic of the students and so on, all of these would affect the training effect of the O-O training mode. In order to promote the O-O training mode better, we ought to find the unadulterated keynote out, make it addresses to serve TVET and the whole society.

Purpose

Since the coming of knowledge economy era, countries all over the world faced up some pressure to human resources development. In order to raise the quality of the mass population, every nation in the world should strengthen its competitiveness. Therefore, proposing some new education modes is necessary nowadays. The major research purpose of this paper is to conceptualize the O-O training mode, and we set sub purposes in research process to fulfill the major purpose.

Methodology

The research design for this study includes three parts as below: research approach, research sample, and procedure.

Research Approach

Interview is a purposeful interaction in which one person is trying to obtain information from another. Interviews can explore and probe participants' responses to gather more in-depth data about their experiences and feelings. They can examine attitudes, interests, feelings, concerns, and values more easily (Gay, Mills, & Airasian, 2006). According to above, this study uses an in-depth interview to collect required data.

Research Sample

Samples were selected from experts who had a studying in the field of the O-O for their theses. Five experienced educators and four experienced engineers who have successfully teaching and work experience were selected as research participants.

Research Design

After literature review, the interview guidelines were established. To facilitate the interview, a semi-structured interview protocol was developed that had three questions. The main questions for interviews include three dimensions:

- To find out the role of the vocational school in the O-O training mode.
- To find out of the role of the enterprise in the O-O training mode.
- To find out of the role of the government in the O-O training mode.

All interviews were taped, after obtaining informed consent of the interviewees. The interviewers were experienced researchers. They received a specific training for this

research, building on the instrument and the detailed protocol. All information about the schools and interviews was coded (Valcke, Rots, Verbeke, & Braak, 2007). The demographic information of the participants is shown in Table 1.

Table 1
Demographic Information of the Participants

Interviewees Coding	Profession	Working Years	Affiliation
A	Educator	12	Chungnam National University
B	Educator	7	Chungnam National University
C	Educator	11	Kunsan Mechanical & Technical High School
D	Educator	9	Janghang Technical High School
E	Educator	4	Daejeon Provincial Administration Training Institute
F	Engineer	11	Hankook Tire Co. Ltd.
G	Engineer	7	Hankook Tire Co. Ltd.
H	Engineer	8	Hyundai Engineering and Construction Co.
I	Engineer	5	Hyundai Engineering and Construction Co.

Results

The Role of the Vocational School

To change the thinking of TVET, to formulate the teaching plan, and to accelerate teaching reform of TVET is the basic guarantee for carrying out the O-O training mode.

Firstly, in order to keep the 'Order' successive, vocational schools ought to establish the market consciousness, and to improve the service consciousness.

The O-O training mode is a kind of characteristic TVET training mode and it is able to provide foreseeable efficient persons for employ persons department. Therefore, according to the interview content, the vocational schools will have to possess a good response to market changes, be good at to grasp the pulse of the market, and can even predict tendency of the market, if they would love to lower the risks and decrease blindness in the process of training. And another kind of basic function is service consciousness, it is revealed in many aspects, such as service object and service level. Therefore, the schools need to understand the market demand in depth and service for technical reform, research and development of products hardy. Meanwhile, the vocational schools need to provide follow-up services for the O-O students and help them to find way out of difficulty that from the life and learning.

Secondly, according to demand of the enterprise and the industry to offer specialty, vocational schools and enterprise construct the course system together.

Offering specialty is the basement of the students' employment, it is able to affect the employment opportunity of the students, even vitality and development of the vocational school's own.

With the record of interview, the O-O training mode is not only aims at some enterprises,

but also faces to all over the industry. Offering specialty needs to combine with the structural adjustment of the regional economies and department of the industry, and it needs to enhance the service abilities for regional economic department.

Furthermore, the core of the O-O training mode is the 'Order', but the 'Order' is from enterprise, and different enterprises have different requirements, so some methodical educational innovation will be important. For this reason, the vocational schools ought to set up a special organ to develop the curricula and regularize the teaching method, and it is also able to engage for the pertinence of curricula and the stability of teaching quality.

Thirdly, take an active part in industry-academia cooperation and optimize the training system.

According to the interview, the interviewees put forward some optimizing propositions about the practice course of the O-O training mode as follows. During the special training, the O-O students have their own organized system, we called it 'the O-O class', and they have special training plan from the school and the enterprise. All of the educators are relevant engineers, technicians and artificers, and they are from the enterprise. The enterprise is able to get periodical reports about the O-O students' learning outcomes from the school, and it must provide enough practice opportunities for the students. At the same time, the enterprise has the rights and obligations about giving some practical suggestions, to help the students to improve their vocational skills and abilities. On that basis, the school and the enterprise can draw up a concrete plan to make the O-O training's guiding ideology, basic principle and operating procedure clear and definite, to prevent the randomness and indeterminacy of industry-academia cooperation, and to create a good atmosphere for the O-O training mode.

Therefore, the teaching method of industry-academia cooperation with ability development as core should be adopted, in this way, the career choice will be clearer, and the specialty commonality will not recede in importance.

Lastly, set up strict and logical educational evaluation system.

According to the characteristic of the O-O training mode, the O-O students' employment pressure is relatively optimistic, so some of them begin to play willfully without any worry. Obviously, it makes against the development of the students. According to the opinions of interviewees, the schools can set up strict assessment system, effectual excitation mechanism and logical elimination mechanism, to solve problems. It is divided into three main parts as follows.

Semester evaluation is a kind of periodic evaluation method for TVET. At the end of every semester, the enterprise is able to obtain all of the report cards and the overall evaluation sheets, and according to their performance on the jobs, the developmental process of the students can be understood clearly. And the enterprise should call a conversation in the partner school every semester, to rewards the best students and remind the underachievers, to form an interfering mode. Moreover, the circulating elimination Mechanism is recommended, According to the order, some students who fail the final exam have to leave the O-O class at the beginning of next semester, and some students who are not in the O-O class will get this opportunity to join in the O-O

class, if they are outstanding enough.

When the O-O students finish their school, they will also participate in the graduation evaluation, and all of eligible graduates can go into the enterprise. Therefore, the graduation evaluation must be extremely normative, detailed and unambiguous. Normative graduation evaluation is able to ensure everyone pleased. The enterprise is pleased, because its benefit is protected; the school is pleased, because its reputation is enhanced; and the students are pleased, because they can get the job by their effort and abilities. And the track evaluation is also a long-term systematic project. According to track evaluation, vocational school is able to get further information from the O-O alumni, and to gather the useful experience for the development of the O-O training mode.

The Role of the Enterprise in the O-O Training Mode

Substantial support of enterprise is the basic demand for take part in the O-O training mode. The objective of industry-academia cooperation is to achieve win-win, namely the school wins the reputation and the enterprise wins the benefit. In order to achieve the win-win goal, the enterprise should cooperate actively, according to the requirement to implement the plan of the 'Order'. In order to pursue immediate interests, some enterprises compel the O-O students to take part in the work prematurely and redundantly; it is practical training in name only, in fact, the O-O students turn into labor force to solve the problem of manpower shortage. If go on like this, the training plan will be disorganized; the vocational ability, vocational quality and fundamental skill will be influenced, and the set objective of the O-O training will be unable to complete, realizing the unadulterated win-win goal will be only a pipe dream. Therefore, according to the interview, enterprise should have some actions as follows.

Firstly, enterprise ought to provide enough tasks and positions for the O-O students. To guarantee the demand for manpower is the primary condition of running the O-O training mode. With enough jobs, the 'Order' can be formed, and the scale effect of the O-O training mode can be built.

Secondly, enterprise ought to provide clear job requirement. Different positions possess different vocational skills in one enterprise. Therefore, enterprise must analyze the professional ability that every job has to possess. And according to all of these, school is able to choose the correlative teaching methods and the teaching goal with a definite aim, thereby try to get rid of teaching blindness.

Lastly, enterprise ought to take part in the whole process of the O-O training mode. Enterprise ought to give play to the role of the human resources and material resources during the process of industry-academia cooperation. The students are able to develop the skills, improve the adaptive capacity of enterprise in the practical curriculum.

The Role of the Government in the O-O Training Mode

Bring into play the coordinative role and supervisory role of the government and competent departments, and adhere to strategy of sustainable development, to create the

good social environment for the O-O training mode.

Taking the interviewees' opinions into consideration, we indicate some difficulties and offered some probable solutions as follows.

The manpower demand of industrial structure should be geared to the scale and speed of development, schools' specialty situation and the level of the overall system of TVET, if it is used to serve the department of the provincial economy at location specific. Market is able to play a certain role to carry out the O-O training mode, but the more important one is the guidance and adjustment of government. Vocational schools and enterprises have different roles in society, because there are many discrepancies in between such as social responsibility, target location, interest orientation and function mode. Even though some enterprises have no mind to add in the industry-academia cooperation, but in fact masses of enterprises are thinking little of it and they have not a few reasons why they are not many passions to participate in activities of human resources training. In fact they feel that human resource training is not their job but vocational education's.

Furthermore, when the O-O training mode runs, connections of various aspects still ought to be coordinated. That will be large and knotty problem, if there is no the 'big hands' of government. Therefore, government ought to take some measures to encourage industry-academia cooperation and then facilitate the O-O training running in enterprises. Interrelated department in charge also ought to give play to the function about information coordinating, to promote industry-academia cooperation, and to lay a solid foundation for the department of TVET.

Conclusions

In this paper, the major research purpose is to conceptualize the O-O training mode. To fulfill the major purpose, we set sub purposes in research contents that are to make the roles of the vocational schools, enterprises and the government clear.

According to interview, all roles of vocational schools, enterprises and government in the O-O training mode are able to be found out as follows.

Firstly, to change the thinking of TVET, to formulate the teaching plan, and to accelerate teaching reform of TVET is the basic guarantee for carrying out the O-O training mode.

Secondly, substantial support of enterprise is the basic demand for take part in the O-O training mode.

Finally, bring into play the coordinative role and supervisory role of the government and competent departments, and adhere to strategy of sustainable development, to create the good social environment for the O-O training mode.

By way of the active coordination of the government, vocational schools and employ persons departments, then be able to set up the long lasting mechanism for the operation and computing of the O-O cultivation pattern, and bring to bear the characteristic of education that are the TVET for facing the market and to serve the

enterprise.

And it is also worth noting that there is a mutual-aid relation between the O-O training mode and the industry-academia cooperation. That means they are able to help each other to grow stronger and stronger. In fact, this is a process of qualitative change, and even more important is we can utilize these limited resources to facilitate development of TVET and still optimize students' training outcomes and employment status.

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Perspectives in the Policy of Language Education: Statistics of the Web Searching Engines

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ABSTRACT This study entered “ultrasound”, “education”, and “nanometer” into search engines in English, Chinese (traditional, and simplified), Japanese, Korean, German, French, Spanish, Italian, Portuguese, and Russian on two internet search engines to find the differences in the searching results between 2007 and 2009. The search of the three words stood for well-developed technology, educational resources, and developing science, respectively. The results showed that there were large differences in the numbers of hits. Furthermore, the numbers of educational websites are increasing in the world. The results pointed out that most countries increase steadily the educational resources. Through the multilingual content of the websites and translation tools, the educational resources are increasing rapidly. Therefore, the multilingual space and citizenship are solid step by step on the internet world.

KEYWORDS education, search engine, knowledge, information, multilingual content

Introduction

The covered rate of network infrastructure and the quality and quantity of digital texture are the crucial indices to evaluate the knowledge propagation level of a country. The items for the evaluation are numerous. Recent studies presented the analysis of searching data from documents and search engines to obtain the meaning of statistics (Lu et al., 2004; Bornmann et al., 2009; Khreisat, 2009). Most of the documents and websites in the internet are in English. Depending on the individual language entering

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the engines, the numbers of searching results were quite different. The differences can influence the usefulness of the information. Some studies presented the analysis of the search engines. Silverstein et al. (1999) studied on AltaVista which indicated it may be useful for search engines to consider search terms as parts of phrases. Jansen and Spink (2006) reported results from research that examines characteristics and changes on Web searching from nine studies of five Web search engines based in the United States and Europe. Eysenbach, and Köhler (2002) described techniques for retrieval and appraisal used by consumers when they search for health information on the internet. Chau et al. (2005) showed that the search in the engine of the Utah state government website. However, based on the top 100 languages by population (Brown, 2009), the Africa's, and Asian's searching and querying in the search engines needs further observations.

This study involved entering the same concept of vocabulary into search engines in English, Chinese (Traditional in Taiwan, and simplified in China), Japanese, Korean, German, French, Spanish, Italian, Portuguese, and Russian to find the differences in the search results without any setting of the selection condition to meet the users' habits. For a long-term observation, we have concurrently searched the number of pages of the same words in the same condition in Yahoo and Google in July, 2007, and March, 2009, respectively.

Most studies related to the statistical researches employ the sampling technique to simplify the problems. In this paper, we explore aspects of the traditional, modern, and future technology to observe the multilingual content in the world. In addition, the vocabulary "education" was searched to present the number of educational sites in the countries. Ultrasound was a well-developed technology based on acoustics which Isaac Newton derived the relationship for wave velocity in solids, and developing the applications of the higher frequency. Education is defined as "the process of teaching and learning" (Summers, 2003). Nanometer (Nanometre) science is a new technology. The new applications of nanometer technology in semiconductor and material science are studying in many countries. In Leydesdorff et al.s' (2007, 2009) studies, the nanometer technology was the symbol of the advanced science to evaluate the technology levels of countries. The search of the three words in Yahoo, and Google represented the samples of the website numbers of searching results for the developed technology, educational purpose, and new technology, respectively.

Methodology

The well-known search engines are, Google, and Yahoo, and the on-line machine translator is dictionary.com. Simple words were selected to avoid uncertain translations into other languages. Firstly, a word, such as "ultrasound," was translated into Chinese (Traditional in Taiwan, and simplified in China), Japanese, Korean, German, French, Spanish, Italian, Portuguese, and Russian by the online machine translator (Dictionary.com). Secondly, the words in the different languages were put into the input

boxes of Yahoo (Web search) and Google. The common users search the engine in default conditions, i.e. without any settings of selection functions. Thirdly, we recorded the numbers of hits which showed in the search results. Finally, the statistics presented in figures, and compute the difference and growth ratio between 2007 and 2009.

The statistics calculated by absolute and relative growth of the numbers of the search results. If a word with x items of search results in 2007, and y in 2009, the absolute growth number (AGN) is $y-x$, and relative growth ratio (GR) is $(y-x)/x$. The results clustered into 3 parts: high growth, growth, and reduced. The ranges of AGN were: (1) greater the 106; (2) between 0 and 106; and (3) less than 0. In GR, they were (1) high growth for $GR>10$; (2) growth for $0<GR<10$; and (3) reduced for $GR<0$.

Results

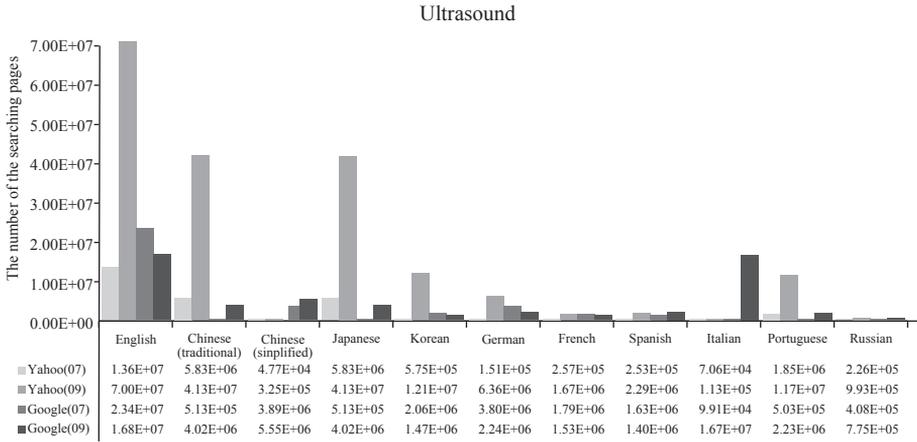
The words “ultrasound”, “education”, and “nanometer” with their translations were presented in Tables 1. The results show that two words, “ultrasound” and “nanometer” are very similar in English, French, Spanish, Italian and Portuguese. Not surprisingly, the most popular language for documents on the internet is English. The numbers of search results in some languages were much less than that in English. Thus, the knowledge resources on the internet are not equal for all countries, especially for children’s learning in different countries. The quality and quantity of learning resources depend on children’s English abilities. The same conditions can be expanded to research, business, and so on in the different countries.

Table 1
The Vocabulary of Different Languages of “Ultrasound”, “Education”, and “Nanometer”

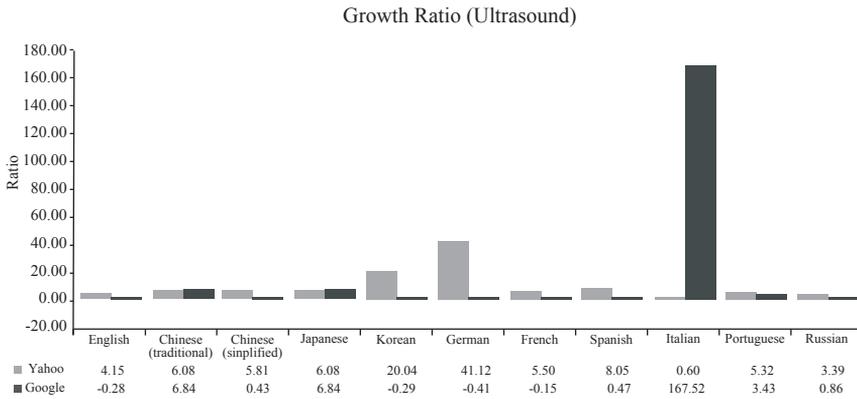
Language	Vocabulary		
English	Ultrasound	Education	Nanometer
Chinese (traditional)	超音波	教育	奈米
Chinese (simplified)	超声波	教育	奈米, 納米
Japanese	超音波	教育	ナノメーター
Korean	초음파	교육	나노미터
German	Ultraschall	Ausbildung	Nanometer + German
French	Ultrason	Éducation	Nanomètre
Spanish	Ultrasonido	Educación	Nanómetro
Italian	Ultrasuono	Formazione	Nanometro
Portuguese	Ultra-som	Instrução	Nanômetro
Russian	Ультразвук	Образование	Нанометр

English is the most popular language on the internet resources from the observations of the search results. In general, the AGN of the three sample words are much increased in Yahoo, but some search results little decrease in Google in 2009. The reason is Google updated, replaced or removed the old websites of the same contents.

The search results of “ultrasound” in different languages presented in Figure 1 whose (a) was for AGN, and (b) for GR. The high growth languages of the AGN results are English, Chinese (Traditional), Japanese, Korean, German, French, and Spanish in Yahoo, and Italian in Chinese (Traditional and simplified), Japanese, Spanish, and Italian in Google. Korean, German, and Italian are in the group of high growth in GR.



(a) Absolute Growth Number

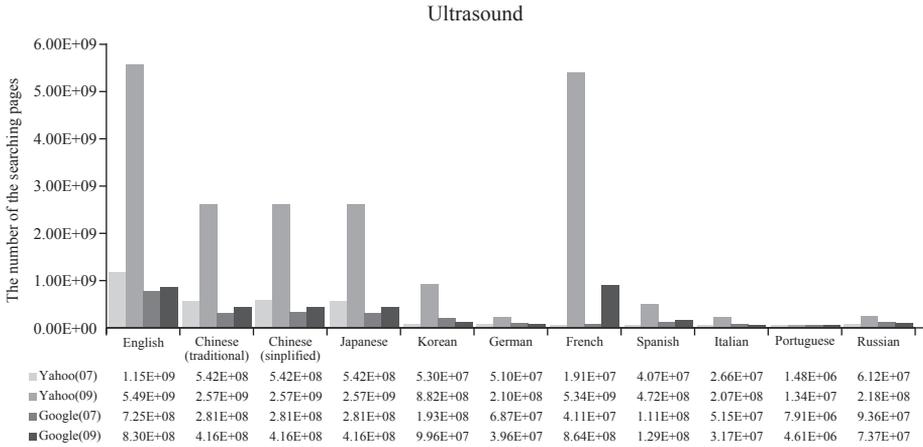


(b) Relative Growth Ratio

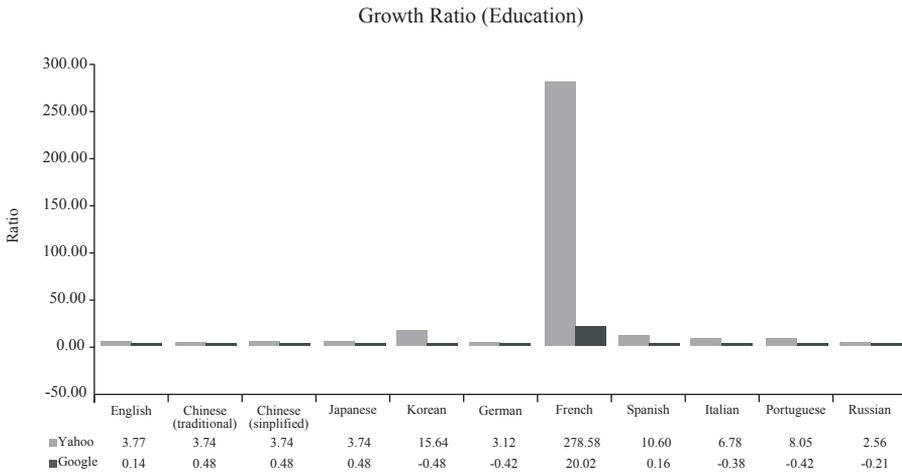
Figure 1. The Search Results of “Ultrasound” in Different Languages

The search results of “education” in different languages presented in Figure 2. The results show that the world is much hopeful. All languages are in the state of high growth in 2009 now. Furthermore, the scale is almost in the range of 107 to 109. It is approvable that some countries involved in educational improvement very aggressively, especially in e-learning. English supports the most educational resources in the internet.

Additionally, French was the only language which got the high growth in AGN, and GR in Yahoo, and Google, individually.



(a) Absolute Growth Number

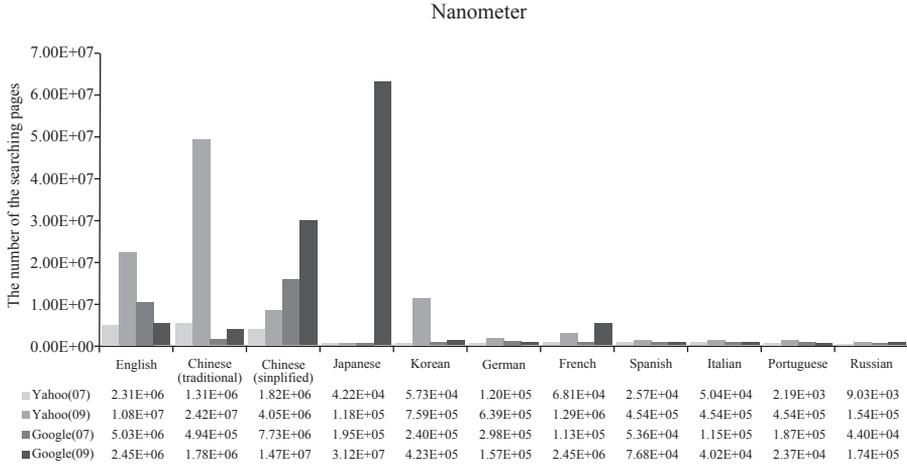


(b) Relative Growth Ratio

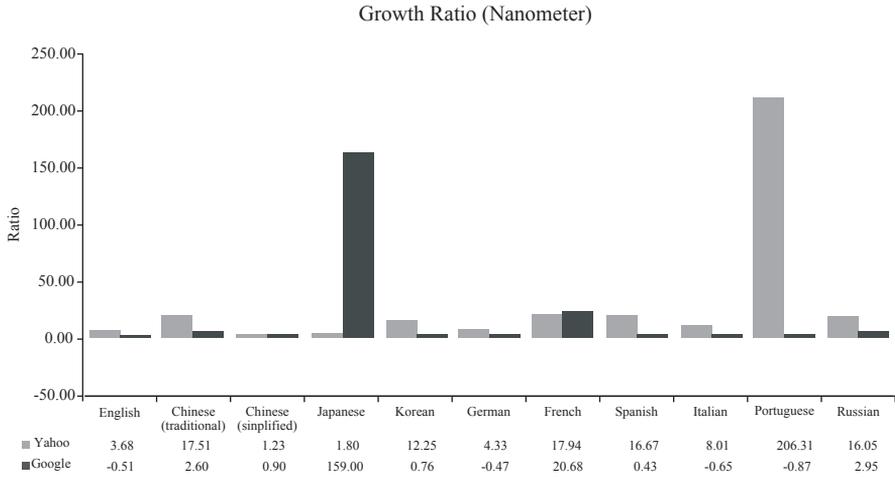
Figure 2. The Search Results of “Education” in Different Languages

The search results of “nanometer” in different languages presented in Figure 3. The high growth languages of the AGN results were English, Chinese (Traditional and simplified), Japanese, and French both in Yahoo, and in Google. From the GR point of view, Chinese (Traditional), Japanese, Korean, French, Spanish, Portuguese, and Russian were in the group of high growth. The nanometer technology is really

developing worldwide now.



(a) Absolute Growth Number



(b) Relative Growth Ratio

Figure 3. The Search Results of “Nanometer” in Different Languages

Discussion

From the points of African view, English and French are the most popular languages in the area. The growths of the contents in these two languages are stronger than others

on the internet. An academic research pointed out that the universities in Africa are catching up with the world university level. The increasing new category of students in South African higher education system is similar to the modern university in advanced countries (Cross, 2009). Furthermore, researchers from the Massachusetts Institute of Technology (MIT) have disclosed the \$100, hand-cranked laptop computer (MIT, 2005). In addition, mobile technology, and information stream in cloud operation will push the brightness of African's higher education. As we know, diverse materials for teachers' training are designed by many departments of education in the universities worldwide (Amin et al., 2009). The goal of the diverse learning is expected to provide the rich knowledge to students for independent thinking. Educators always encourage students to be aggressive self-learners. The digital texture on the internet is exactly a useful resource for their learning. What kind of language policy will influence the improvement of the African's countries in the era of the electronic network? Based on the results of this paper, the findings strongly support that English is the best language to access the content on the internet. Although English is not the native language, some instructors of universities in Taiwan teach the professional materials in English. The goal is to enhance students' English abilities. Recently, the economic power in China is growing and the learning of Chinese is hot in United States. Therefore, the foreign language learning is varied by the stream of economic power in United States, and will change the policy of other countries. The consideration of populations in the world might provide a guide to think of the linguistic policy. We have to emphasize that considerations of the policy for accessing new technology and those for international trade are quite different. The countries in African might balance the two perspectives to form the multilingual policy. However, advanced science and technology have been and will continue to be the engine for economic growth, and national security (Li, 2009).

The clusters which were ranked by AGN, and GR presented in Table 2, and 3, respectively. In summary, English is the most popular resources on the internet and high growth in ANG. French, and Japanese are in the group of high growth both in ANG, and RG in the three samples. Chinese (traditional and simplified) supported many contents on the internet. All of the languages presented a very high growth in the search results of "education".

The meaning of the words entered into search engines could be presented in several languages indicated by the user, and the items in the search results could include results from searches with the same term in different languages. It's time to learn something on the internet also learn something related to something else, including languages. For example, someone who wants to travel aboard will construct a timetable on the internet. It is a good time to learn the schedule in another language, because of his needs and curiosity. When he is looking for where he makes a reservation, he will encounter airlines, types of planes, cities, and hotel reservations. Keeping the related activities for several days may enhance the memorization of the relevant vocabulary. The other example is academic research. Academics are curious and always need to search documents, papers, patents, tables, and diagrams worldwide. Furthermore, voice may be an optional function of keyword translation to improve pronunciation. Lu et al. (2004)

have computed the apparent frequency of English vocabulary in textbooks on computer architectures and have aided students in studying English for many years. The research

Table 2
The Cluster Ranked by the Growth Number of Websites

Searching Vocabulary	Yahoo			Google		
	High Growth (AGN>106)	Growth (AGN>0)	Reduced (AGN<0)	High Growth (AGN>106)	Growth (AGN>0)	Reduced (AGN<0)
Ultrasound	English	Russian	-	Chinese	Russian	English
	Chinese (traditional)	Chinese (simplified)		(traditional)	Portuguese	Korean
	Japanese	Italian		Chinese (simplified)		German
	Korean			Japanese		French
	German			Spanish		
	French			Italian		
	Spanish					
Education	all	-	-	English	-	Korean
				Chinese (traditional)		German
				Chinese (simplified)		Italian
				Japanese		Russian
				French		
				Spanish		
				Portuguese		
Nanometer	English	Japanese	-	Chinese	Korean	English
	Chinese (traditional)	Korean		(traditional)	Russian	German
	Chinese (simplified)	German		Chinese (simplified)	Spanish	Spanish
	French	Spanish		Japanese		Portuguese
		Portuguese		French		
		Italian				
		Russian				

Note: The search was conducted in July 2007, and March 2009

revealed that memorization of frequent vocabulary greatly improves sentence comprehension.

Web searching results could be presented as a combination of English websites and websites in the language of the keyword search. If a concept is entered in Portuguese, the search results could be 5 items in Portuguese and 5 items in English on a page. Thus, the resources “in Portuguese” on the internet would be much increased. The exited selection function is good, but may limit the search results. Because the selection of searching in several languages could take hours in the engines, displaying the links for two or more languages can improve both language training and efficiency of search. Regarding advertising, some international trade could be promoted by the proposed change in the display of search engine results.

The search results of “nanometre” are 1,290,000 items in Yahoo and 3,130,000 items in Google. Therefore, some vocabulary of the same meaning in the languages

Table 3
The clusters ranked by growth ratio

Searching Vocabulary	Yahoo			Google		
	High Growth (GR>10)	Growth (GR>0)	Reduced (GR<0)	High Growth (GR>10)	Growth (GR>0)	Reduced (GR<0)
Ultrasound	Korean German	English Chinese (traditional) Chinese (simplified) Japanese French Italian Spanish Portuguese Russian	-	Italian	Chinese (traditional) Chinese (simplified) Japanese Spanish Portuguese Russian	English Korean German French
Education	French Korean Spanish	English Chinese (traditional) Chinese (simplified) Japanese German Italian Portuguese Russian	-	French	English Chinese (traditional) Chinese (simplified) Japanese Spanish	Korean German Italian Portuguese Russian
Nanometer	Chinese (traditional) Korean French Spanish Portuguese Russian	English Chinese (simplified) Japanese German Italian	-	Japanese French	Chinese (traditional) Chinese (simplified) Korean Spanish Russian	English German Italian Portuguese

Note: The search was conducted in July 2007, and March 2009

such as nanometer and nanometre might make few errors of statistics. It needs a further study in different languages of search. Given our findings, we proposed a modification in how search engines operate. However, this study examined all of the information meets the three samples.

The search results for “nanometer” in Google disclosed that the number of hits for simplified Chinese is more than other languages. Due to population, the number of websites in Chinese will increase and will support more information on the internet. In the comparison of Leydesdorff et al.s’ studies (2007, 2009), our studies presented the high developments of nanometer technology in the native English speaking countries.

Globalization is a hot topic (Newberry, 2005). After the Europe Union operated, the globalization is more important to internationalized communication, trade, and knowledge management. Therefore, inter-language learning in search engines may accelerate the pace of globalization. The number of websites in some languages, such as

Portuguese and Russian were much increasing. We know that the internet world is becoming open. The search results of “Education” are high growth in all of the language, and e-learning websites are increasing in many countries. Therefore, the open educational resources will make the world be better.

Conclusions

Entering a concept in search engines produces quite different results in terms of the numbers of hits depending on the language used. Based on the comparison of the search results in 2007, and 2009, the change can be an indicator for the professional fields of development. The numbers of educational websites are increasing in the world. The results pointed out that most countries improved the educational resources.

Most universities include the educational aim of responsible citizenship. Educators should teach not only academic theories and professional skills but also the moral aspects such as religion, patriotism, kindness, faith, and peace (Sookrajh et al, 2009; Jita & Ndlalane., 2009; Waghid, 2009). Globalization bases on the understanding of the people in every country is the most correct and safe way to realize in a peaceful model. From the statistics of this paper, we confirm that governments of many countries attach great importance to education, especially in the digital texture in the internet. Therefore, building common multilingual spaces and citizenship have been developing in every country by increasing the content and translation tool on the internet. Lu et al. (2004) indicated that 1500 frequent-appearance vocabulary words make up almost 90% of the words of the two textbooks for the Computer Organization and Architecture class in electrical engineering. Therefore, it is possible for anyone who memorizes only the 1500 vocabulary words to read a technological document in a foreign language, using his or her working experience and logical thinking. Many scholars encourage people who want to improve their foreign-language ability to read newspapers, which provide multitudinous reading materials. It is natural for one who can find the most suitable materials to read and expand to other fields. Therefore, in the trend of Life-Long Learning (Jiusto & DiBiasio, 2006; Kosova, 2010), the educators and students can find the better mean for self-learning.

In Asia, the communication among United States, Taiwan, Korea, Japan, and, China are frequenter and more important than ten years before, because the economic activities in mainland China connects with the other countries. However, some conflicts cause from the race of the country power. However, the proposed language policy will enhance the ability of communication to avoid misunderstanding among the countries, and promote the power of knowledge in the countries. The impacts might cover not only absorption of knowledge but also the experience exchange in the open internet world. The platform gives everyone more chances to know the other countries. Based on the statistics, we believe that the countries are going to develop the advanced technologies for a better life.

Acknowledgements

We appreciate the supports of “The Curriculum Simulation Projects at Tunngan University for the System Links in the Technical and Vocational Education Systems”, Ministry of Education, and the research projects of the National Science Council, and project number 99-2221-E-002-047, National Science Council, Taiwan, Republic of China.

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