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# The Way and Idea Vocational Education Exists

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**ABSTRACT** In this article, I try to clarify that vocational education, with its pragmatic and economic aims, converts even these factors to enhance character formation. First, there is one challenge for modern vocational education to consider this educational effect of character formation that fosters the “partial person” as something positive. Secondly, we have to consider this task relevant to partnership with industrial society. Thirdly, we need to grasp this matter in view of the formation of selective value consciousness, besides any consideration of knowledge and skill. In recent Japan, the paradigm change in vocational education concept is occurring.

**KEY WORDS** Vocational Education, Japanese Dual System, Character Formation

## Introduction

### What is Vocational Education?

If corresponding to something to be economic and practical is a specific requirement of vocational education, its idea should include both consideration of the roots of education which means personality formation and consideration of the labor and vocational ability necessary for living as a full-fledged worker. Even though it has been said that to pursue vocational ability required by enterprises cannot be called “education” but merely “vocational training” or “human resource development,” such thinking only results in disassociating the task of practical (vocational) ability development from the concept of vocational education. Such thinking may also be an indication of the presence of an adverse reaction to middle-class jobs (types of job corresponding to the intermediate level of vocational education) and skilled workers, which vocational education/training has long been pursuing. The matter involves more than the consideration of “wide-ranging vocational education” in a broad sense, discussed in the context of general education and liberal arts education.

In Japan, vocational education generally indicates specialized vocational preparation at high school, specialized courses and specialized training schools managed by the Ministry of Education, Culture, Sports, Science and Technology, and vocational training indicates the training of skilled workers, technicians at vocational ability development colleges, managed by the Ministry of Health, Labor and Welfare. However, in Western

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countries, especially in Western Europe, vocational education and vocational training are not differentiated by administrative jurisdiction or what is emphasized in the content of training. Vocational preparatory education before employment is called “vocational training” (*Berufsausbildung*) or “initial training” (*Erste Berufsausbildung*), in the same sense as ‘teacher training’ or ‘doctor training’ in Japan, whereas ability development (improvement) after employment (acquisition of qualification) is called “continued vocational education,” and both of these are collectively referred to as “vocational education (*Berufsbildung*).” When I use the term “vocational education,” it indicates initial vocational training, taking place before employment as vocational preparatory education.

### **Key Points of Discipline for Vocational Education**

There are three points concerning principles (pedagogy) when discussing such issues as vocational education. One such matter concerns the aim of character formation through vocational education, which is: “How to view the general task of human formation presupposing vocation (meaning the continuous performance of a certain role within the social/economic system).” The second is: “How to establish role-sharing relationships between training facilities such as schools and corporations,” within the context of vocational education, where training of labor ability is required. This is the target of school vocational education, for the time being. The third point is: “Where to locate the mental aspects concerning vocation (job consciousness and vocational view).” What follows is an interpretation of these three points

## **Non-Educative Value of Vocation and Educative Value of Labor**

### **The Issue that “Vocation Isolates Human Beings from One Another”**

Due to the tendency for negativity with regard to playing the role of training labor ability within an economic society, educational circles in Japan were reluctant where “specialized” training was concerned, since such training could lead to the classification of human beings.

Before discussing the principles of vocational education, we first need to discuss the relationship between vocation and a human being. Where this issue is concerned, there has been no discussion to surpass those made by Odaka (1941, 1970) in the line of “vocational-sociological discussion” by Weber, with most of Odaka’s semantics on vocation still being reflected in the Japanese Classification of Occupations (Definitions) created by official statistics. That is to say, vocation is a continuous human activity with economic (means of living), social (role performance) and psychological (expression of individuality) aspects. Therefore, preparing a person for such vocational activity (education) also embraces these three inherent aspects.

However, there is a unique ideological context within educational circles, where especially the former two aspects are considered to contradict the last aspect of “expression of individuality/self realization,” or where the former two aspects are

denied as “dehumanizing” in real life, and therefore the vocational effect of character formation itself is also denied. Even if it is not denied, vocational education was considered to be an activity of “necessary evil” which humans cannot do without in order to live. Let’s look into some such discussions.

We can see the influence in the works of scholars such as Shuichi Katsuta, who had great influences on Japanese pedagogy and vocational education in the post-war era (Katsuta, 1973).

“Vocation isolates people, and there are two sides to the isolation. One is that, since the person is trained to obtain specific skills and knowledge, he/she becomes alienated from learning other skills and knowledge. The development of a restricted area is promoted at the expense of the development of wider possibilities (p.205).”

This is a negation of vocational education. This quote, stating that vocation “isolates people,” can in fact be traced back to the discussion of liberal arts made by Langevin, who worked on the educational reform of French secondary schools in the 1940s. According to Langevin, “Vocation isolates human beings from one another,” whereas “Liberal arts bring human beings close together (Langevin, 1974).”

The problem begins here. Katsuta, as in the following statement, affirms the education of “labor” as a part of liberal arts: “The essence of liberal arts is to be total and universal. So, the desirable liberal arts can be grasped by setting the relationship of learning and labor as the axis (p.224).”

### **Overcoming the Idea of Vocation being a “Necessary Evil”**

What does it mean that the significance of labor in human formation is accepted, and that of vocation is not? Does it mean that only some certain occupational forms of labor, labor free of any capital mechanism, or the abstracted concept of labor can be valued as capable of human cultivation? If such ideas of vocational education where specialization is negated are not overcome, and if the value of human being (life) to be cultivated through the lifelong pursuit of a specialized occupation, whether the area is narrow or wide, is not affirmed, it is impossible to change the status of vocational education as being a “necessary evil”.

In that respect, the same sort of problem can also be pointed out in the recently suggested issue of “career education,” where there is a tendency to “teach the way of life instead of vocational education” (at the field level), and that the idea of vocation being the core of life career, and especially, the urgency that vocation presents for young lives, tend to be “obscured at the end.” What is necessary in Japanese vocational education (and its discussion) is to admit that there are both aims of economic means and character formation within vocational education, and it is also necessary to establish the standpoint that the human cultivation of human beings (adults) is implemented (education is completed) by nothing else but vocation (Terada, 2004a).

## Can Vocational Education Be Taught Only in Schools? What the Japanese Dual System Suggests

### The Self Completed Nature of the Japanese Vocational Education within Schools

Next we come to the issue of sharing of roles between schools and companies (vocational society) concerning the content of vocational education. Where issue of the training of labor ability is concerned, the curriculum has basically been completed within schools in the Japanese vocational education system (vocational high schools, specialized training schools, vocational ability development colleges, technical colleges, etc).

For example, in the case of high school vocational courses (currently called as “specialized courses”), a climax was reached with the enforcement of Curriculum Guidelines in 1960 and 1970, where the schools aimed to foster “mid-level technicians” or “commercial workers/business managers/clerical workers” by themselves, establishing relationships with the following in-company education as is shown in the upper part of Figure 1. I call this the “serial” connection (without “transition process” in curriculum) of the curriculum of vocational education (Terada, 2004b).

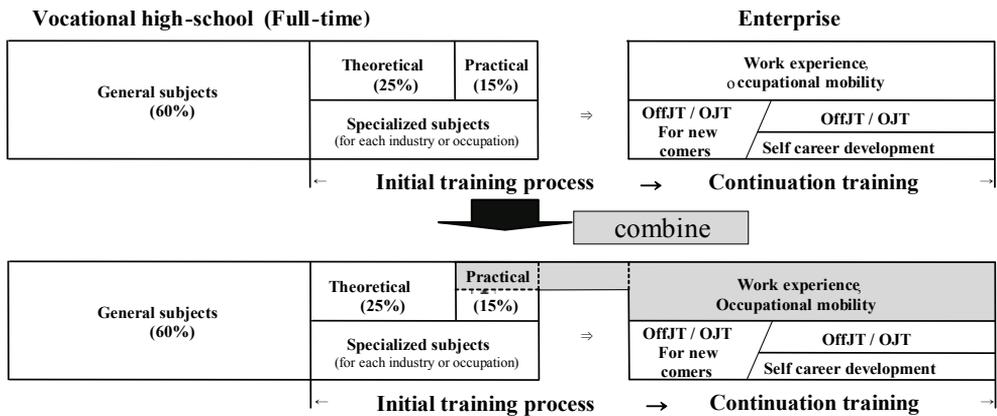


Figure 1. School and Company in the Transition Process

### Japanese Dual System

On the other hand, “Self-reliance/Challenge Plan for Youth” was released in June 2004 in the name of four ministries including the Ministry of Education, Culture, Sports, Science and Technology and the Ministry of Health, Labor and Welfare, urged by recent problematic phenomena such as the issue of ‘fleeters’ and youths who are leaving their jobs early. In the plan, a “Japanese dual system,” a new system close to the dual system of Germany (Terada, 2003) is introduced, in order to compensate for the deficiencies in the abovementioned Japanese vocational education model. There has been much dispute about this system, with comments such as “After all, a German system will not take root

in Japan” and “It is too early to introduce the system, because the conditions are not right.” Indeed, the results of the “dual system” promoted by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) and the Ministry of Health, Labor and Welfare still falls short of the reform of initial training itself, remaining as a mere extension of career education (internship) and measures for ‘fleeters’, along with some activities in experiment districts (schools).

However, I consider that vocational education, whether it is carried out by schools or by companies, can be simplified to the acquisition of specialized knowledge, skills, and norm/behavioral pattern necessary in order to be engaged in each vocation. Of the three factors, even though knowledge/classroom lectures should be the responsibility of schools, I consider that skills, especially practical skills for application outside of basic skills, can only be acquired on-site. Until now, the Japanese tradition was to consider that those skills could be acquired after the person became employed. The future will vary greatly depending on whether Japanese vocational education can recognize on-site practical training at companies as a system that is necessary for the formation of vocational ability, as well as for the “fostering of vocational view.” Basically, vocational education is, more or less, oriented towards a dual system (see the lower figure of Figure 1).

## **The Issue of the Positioning of Vocational View**

### **Can Vocational View Be Established in Japan?**

As I have mentioned before, vocational education should include education concerning mental attitude towards vocation, motivation for the corresponding vocation, and the creation of social significance (formation of value consciousness). The issue of vocational view is discussed as a crucial matter within recent career education movement and there are even tendencies to expand the concept so as to equate the “formation of vocational view” with “vocational education.” Furthermore, its necessity is emphasized not within specialized vocational education but rather in general education and higher education, where discussion can possibly lead to the issue of vocational ability formation (vocational education in the narrow sense), beginning with the issue of vocational view formation.

However, Japanese vocational education (at schools) originally had little experience in positioning the issue of vocational view, just as in the case of the abovementioned Japanese dual system. For example, the aims of “agriculture,” “industry” and “commerce” according to the High School Curriculum Guidelines are all noted as “the practical attitude ... to enable social development” (MEXT, 1999). The aims of the past do not vary much either. What is advocated is that, it is necessary to have the students acquire the attitude (custom) required in working for the development of agriculture, industry and commerce. It does not aim to have the students learn about the economic or social significance of each vocation, let alone have them experience and become familiar with the mentality of the corresponding worker. In the first place, “agriculture,”

“industry” and “commerce” are only concepts created to classify "industry" (kind of industry). Also, vocation (type of occupation) is not taken seriously within the task of vocational view formation, but should be implemented in the Japanese employment market, and therefore in the career counseling at schools. Instead, vocational view is placed on the kinds of industry and company rankings. In such a situation, vocational view will become something abstract beyond concrete vocation (type of occupation) and vocation groups, making it harder to create educational materials.

Training of a working attitude in any industry or vocation, cognition of the social significance/role in working, and above all, formation of the vocational view cannot be achieved simply by acquiring an attitude to keep working no matter what. Be that as it may, we must start from creating educational materials of the vocational role each vocation and vocational group has, or of the unique vocational ethos of the people who engage in the vocation (several of them), under the circumstances where the ‘fleeter’ trend and the “7/5/3” phenomenon (I call it “7/5/4” phenomenon, since the rate of college graduate recruits who leave their jobs within three years are approaching 40%) do not seem to be improving.

In German, engineer students learn the code of ethics of the professional associations in any cases, and also, the social responsibility and ethics of that vocation are surely included within the learning process of the training for Masters or specialized workers. It is also necessary for Japanese specialized education to begin by teaching knowledge/skills concerning social, economic and human formation aspects of the vocation, and to develop the learning into an issue of selective (non-imposed) vocational consciousness formation, through learning by practical experience as well as learning technical knowledge/skills of the corresponding vocation (industry). At least, I would like to propose the development of the issue of “view” which used to be considered as a supplementary factor, to be treated within classrooms.

### **Internalization of Vocation**

Of course, it depends on each student or adult to decide which aspect they feel is significant within a certain vocation or specialized task, which to choose and continue with, and the conditions also vary depending on each person’s development process. I feel that using higher concepts such as “vocational view” or “labor view” in a lump will only make the issues of childhood and adolescence more abstract. When referring to the discussions of vocational/career development made by Super (1957) or Schein (1978) Career Dynamics (1991), vocational view is the belief that each person is questioned at each turning point of his/her working life (“the types of qualification/motivation/value” each person is aware of, as it is put by Schein, is equal to the motivation and value that matters when considering career anchors), which becomes clarified when changing careers, or hypothetically, becomes clear at last when the person leaves his/her job.

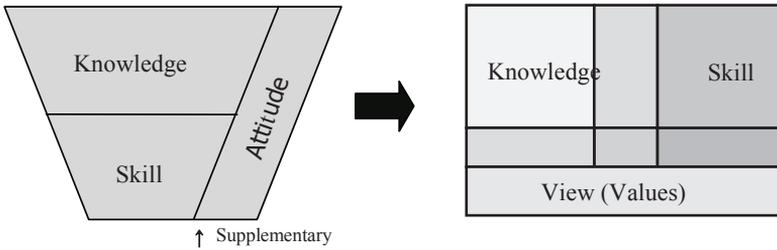


Figure 2. New Concept of the Vocational Education

In short, the formation of aspiration, desire or identity concerning vocation will be necessary during childhood and the early period of adolescence. After these stages, each person should internalize the concrete image of the vocation he/she might take up, in parallel with vocational education or as a part of it. Moreover, what is important for the youth is to utilize occasions such as internship in order to fully learn the professional, economic and social realities of the vocations through experience, and also to train them how to solve problems or make adjustments when such occasions arise in the future, although we often emphasize “social role performance” or “self realization” when talking about “vocational view.” On that basis, we at last become able to look at vocational view (value consciousness) comprehensively. As the result, we can schematize the recent changes of Japanese vocational education issue as Figure 2. It is so important that we don’t discuss the core role of knowledge and supplementary position of attitude (view), but signify the balance relationship knowledge, skill and vocational view.

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## **Reorientation of Secondary Vocational Education in Korea**

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**ABSTRACT** The developmental paradigm of past Korea is able to summarize growth, to factor input - investment, and to be a leading imitation of advanced nation growth strategy. From 1970's, the vocational education policy at the secondary level of Korea has been supplied and propelled in a training course which is industrial human resource of simple vocational technicians during a short duration, and they were the motive power of the high level of Korea's economic growth. But, the potential growth rate of Korea has decreased down recently, so such a paradigm no longer applies, because the rate of economic growth has been fluctuated around about 5% during the past years. The previous developmental paradigm, called the 'nutcracker' or 'sandwich Korea', is no longer effective in the crisis situation of the present; the new paradigm for a sustainable growth is needed. Consequently, from training 'a standard-bearer of the fatherland modernization' expressed of past Korea, it will be able to set the direction of the secondary level vocational education in new developmental paradigm in order, and it is a necessity which will amend the aim. By the education logic even on the economic logic corresponding together in objective of education of the secondary level, the place it will can be charged at the school which is the possible to be meaning education. In this research it looks for aim of the secondary level vocational education which corresponds in the developmental paradigm it follows in the society - economic change of Korea and it will propose it does the plan for an activity.

**KEY WORDS** Vocational Education, Specialized High School, Manpower Training

### **Background and Objectives**

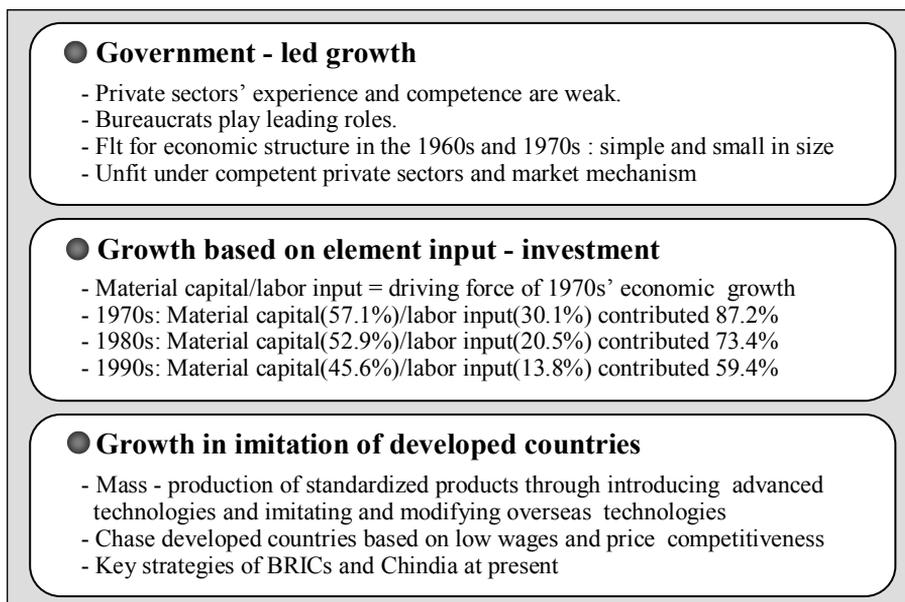
The development paradigm of Korea in the past can be summarized into government-led growth, growth through element input and investment, and growth in imitation of developed countries.

Complying with the paradigm, since the 1970s, policies for vocational education at specialized high schools have been made and executed in the short-term to supply the demand of industrial manpower, mainly unskilled technicians required by the country.

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Trained low-wage or skilled technicians have been the driving force of the fast and high growth of Korea in recent years. However, these policies overemphasized economic logic from the side of suppliers backed by the central government, relatively neglecting the educational significance of vocational education. As a result, the importance of vocational education at specialized high schools was not recognized; rather, people came to have negative images of specialized high school education.



*Figure 1.* Development Paradigm of Korea in the Past

Recently, the potential growth rate of Korea has been decreasing continuously, and the economic growth rate is hovering around 5%. Thus the paradigm shown as in Figure 1 is valid no more. In the current situation of crisis called 'Nutcrackers' or 'Sandwich Korea,' the past development paradigm is not effective any more; therefore, a new paradigm for the country's sustainable growth is now required.

The goal of vocational education at specialized high schools also needs to be changed from education of 'the standard-bearers of national modernization' in accordance with the development paradigm of Korea in the past to a new goal fit for new development paradigms. Furthermore, we need to consider how to restructure specialized high schools so that they execute meaningful education based not only on economic logic but also on educational logic matching the goal of secondary-stage education.

Therefore, the purpose of this paper was to look for the future direction of vocational education at specialized high schools, which are secondary-stage vocational education institutions in Korea, in response to social and economic changes, and to suggest how to activate vocational education at specialized high schools.

## Issues Related to Secondary Vocational Education in Korea

In order to activate vocational education at specialized high schools, there are a number of internal and external problems to be solved surrounding specialized high schools.

### Controversies over the Identity of Specialized High Schools

Discussion about the goal of specialized high school education, which was started even before the announcement of the 7th National Curriculum, is still vacillating between terminal education, which assumes going to work immediately, and continuous education, which assumes advancing to a higher education institution. The current national curriculum states that both directions are pursued simultaneously. Individual schools also offer two forms of curriculum under the name ‘dualized curriculum’, one for working and the other for continuous study. Although a dualized curriculum is possible theoretically, it has had difficulties in actual curriculum operation.

### Different Demands among Specialized High School Consumers

Different from ordinary high schools, specialized high schools have two groups of consumers, students and industries. These two groups have contradictory goals. Specialized high school students and their parents want continuous study rather than working immediately after graduation (the percentage of students who entered universities is 68.6% as of 2006 and the percentage is steadily increasing), but industries want the students to work in the field right after graduation.

Table 1  
*Different Demands among Specialized High School Consumers in Seoul*

Year	Continuous study	Employed	Joining the army	Unemployed	Unknown	Total
1970	6,033( 9.6)	31,569(50.2)	814( 1.3)	11,979(13.1)	12,459(19.8)	62,854(100.0)
1975	11,048( 8.8)	63,437(50.3)	2,060( 1.6)	25,381(20.1)	24,215(19.2)	126,141(100.0)
1980	23,019(11.5)	102,812(51.2)	1,494( 0.7)	44,908(22.3)	28,824(14.3)	201,057(100.0)
1985	36,910(13.3)	143,214(51.8)	2,528( 0.9)	44,162(16.0)	49,721(18.0)	276,535(100.0)
1990	22,710( 8.3)	210,112(74.3)	1,402( 0.5)	16,108( 8.2)	23,817( 8.7)	274,150(100.0)
1995	49,699(19.2)	190,148(73.4)	333( 0.1)	7,582( 2.9)	11,371( 4.4)	259,133(100.0)
2000	122,170(42.0)	149,543(51.4)	523( 0.2)	10,508( 3.6)	8,303( 2.9)	291,047(100.0)
2001	121,411(44.9)	130,968(48.4)	481( 0.2)	10,140( 3.8)	7,393( 2.7)	270,393(100.0)
2002	115,103(49.8)	104,138(45.1)	347( 0.1)	6,155( 2.7)	5,384( 2.3)	231,127(100.0)
2003	109,234(57.6)	72,212(38.1)	251( 0.1)	4,305( 2.3)	3,508( 1.9)	189,510(100.0)
2004	113,944(62.3)	60,062(32.9)	354( 0.2)	5,040( 2.8)	3,435( 1.9)	182,835(100.0)
2005	115,164(67.6)	47,227(27.7)	393( 0.2)	4,327( 2.5)	3,148( 1.8)	170,259(100.0)
2006	111,601(68.6)	42,151(25.9)	402( 0.2)	5,348( 3.3)	3098( 1.9)	162,600(100.0)

Source: National Education Statistics Information Center. (by year).

**Bipolarization of the Level of New Students at Specialized High Schools**

Existing specialized high schools have been branded “second-class education” and have been considered schools for academically inferior students. However, based on academic achievement, the level of students entering specialized high schools tends toward bipolarization. As presented in Table 2, the competition rate among specialized high school applicants in Seoul has been increased steadily from 1.07:1 in 2005 to 1.15:1 in 2006 and 1.18:1 in 2007. Among specialized high schools, the highest competition rate in 2007 was 2.70:1 and the lowest was 0.99:1.

Table 2  
*Competition Rate among Specialized High School Applicants in Seoul*

Year	2005	2006	2007
Competitive rate	1.07:1	1.15:1	1.18:1

Source: Internal data of the Seoul Education Office. (2007).

According to Table 3, which shows the average school records of new students at specialized high school during their third year in middle school, there was continuous improvement from 74.2% in 2005 to 71.0% in 2006 and 67.7% in 2007. The entrance of academically superior students is particularly remarkable at specialized vocational high schools. Among new students at specialized vocational high schools, the average school record during the third year in middle school improved from 54.32% in 2005 to 49.1% in 2006 and 42.0% in 2007. In case of ‘S High School,’ a specialized high school in Seoul, the average school record of new students in 2007 was 16.74% (highest record - 3.40%). However, there is also a specialized high school in Seoul, at which the average school record of new students is 95.69% (highest record – 60.00%).

Table 3  
*Average School Records of New Students at Specialized High Schools*

Year	2005	2006	2007
Special-purpose high school	62.5%	60.7%	59.1%
Specialized vocational high school	54.3%	49.1%	42.0%
Ordinary specialized high school	79.4%	75.6%	73.0%
Total	74.2%	71.0%	67.7%

Source: Internal data of the Seoul Education Office. (2007).

Accordingly, we need to set school education goals differentiated according to bipolarized students’ level, and suggest diverse career paths.

**Bipolarization of Mid- and Long-term Manpower Demand**

As for the trend of labor demand for the last 10 years and anticipated increase rate of labor demand by job category (large classification), the increase rate was highest in employed specialists (6.6%), but decreases were observed among skilled workers of

agriculture, forestry and fishery, and among technical workers and equipment operators, showing an obvious change in the quality of labor demand.

According to predictions up to 2020, however, the increase rate was highest among service workers and, next highest, respectively, among unskilled laborers, specialists, technicians and semi-specialists. While the number of office workers is expected to maintain the status quo, salespersons and skilled workers in agriculture, forestry and fishery are expected to decrease continuously. This phenomenon suggests that labor demand will be ‘bipolarized,’ centering on high skill, high-technology jobs.

Therefore, in response to the change of industrial structure and the prospected manpower demand and supply, vocational education needs to be reorganized into a system that can raise multi-dimensional manpower in consideration of learners’ ability and level, namely, educate high-quality professional manpower, backbone technological manpower, and practical technological manpower.

As to employment by job category, specialists are expected to increase (specialists by 2.70% and semi-specialists by 1.64%), and workers in agriculture, forestry and fishery are expected to decrease (by 2.80%). The employment of specialists shows a high rate of increase (scientists by 7.3% and engineers by 5.4%) but the employment of educators is expected to maintain the status quo (0.5%).

Table 4  
*Anticipated Increase Rate of Labor Demand by Job Category*

Job category (large classification)	1993~ 2003	1993~ 1997	1998~ 2003	2003~ 2020	2003~ 2010	2010~ 2015	2015~ 2020
Managers	1.34	0.43	3.86	1.60	1.35	1.88	1.67
Specialists	6.59	2.75	9.14	2.70	3.45	2.29	2.05
Semi-specialists	3.49	9.79	0.13	2.59	4.06	1.77	1.36
Office workers	2.52	1.67	5.04	0.13	0.20	0.63	0.10
Service workers	4.19	10.00	1.80	3.18	3.91	2.95	2.41
Salespersons	2.39	0.11	5.10	0.55	0.04	0.36	1.54
Skilled workers of agriculture and fishery	2.33	1.60	4.30	2.06	1.61	2.35	2.38
Technical workers	1.66	3.03	1.06	1.36	2.35	0.93	0.41
Equipment operators	0.45	2.80	2.55	1.85	1.99	1.83	1.67
Unskilled laborers	1.01	2.61	2.39	2.85	2.81	3.03	2.72
Total	1.42	2.48	2.12	1.51	1.88	1.43	1.08

Source: Ahn, J. Y. (2004).

Employment of service workers and unskilled laborers is also expected to increase by 2.70% and 2.37%, respectively. Service workers and unskilled labors including those engaged in cooking and food services (3.0%) and unskilled manufacturing work (4.0%) are expected to show a steady increase. In employment structure by academic qualification and job category, those graduated from high school and below are expected to decrease in most job categories except unskilled labor and service, and those graduated from two-year colleges and above are expected to increase in most job categories except agriculture, forestry and fishery and technical service.

Table 5  
Average Annual Increase Rate of Labor Demand by Job Category

Job category (large classification)	2004	2010p	2015p	Average annual increase rate		
				(05~10)	(11~15)	(05~15)
Assembly members, high officials and managers	572	636	681	1.77	1.38	1.59
Specialists	1,688	2,091	2,284	3.63	1.78	2.79
Technicians and semi-specialists	2,440	2,741	2,919	1.95	1.27	1.64
Office workers	2,855	3,031	3,051	1.01	0.13	0.61
Service workers	2,917	3,465	3,910	2.92	2.44	2.70
Salespersons	2,686	2,755	2,639	0.42	-0.85	-0.16
Skilled workers of agriculture, forestry and fishery	1,878	1,586	1,373	-2.78	-2.83	-2.80
Technicians and related technical workers	2,707	2,744	2,803	0.23	0.43	0.32
Equipment and machine operators and assemblers	2,416	2,655	2,836	1.59	1.33	1.47
Unskilled laborer	2,399	2,740	3,103	2.24	2.52	2.37
Total	22,557	24,444	25,600	1.35	0.93	1.16

Source: Jang et al. (2006).

### Plans to Activate Secondary Vocational Education in Korea

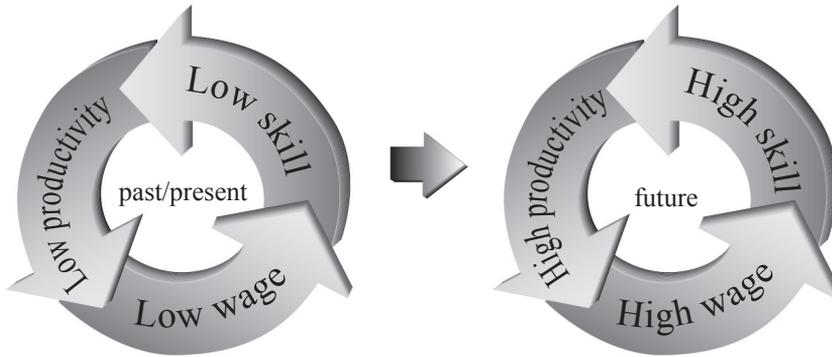
We need to make plans to activate vocational education at specialized high schools to cope with internal factors such as the obscure identity of specialized high schools, different demands from specialized high school consumers and the bipolarization of students' level at specialized high schools, and external factors as the bipolarization of mid-and long-term manpower demand.

### Setting the Goals of Manpower Education in Tune with the Direction for Industrial Reform

In accelerating economic growth in Korea, it is not desirable to induce growth by expanding the input of elements such as labor and capital because labor and capital are limited resources (Chae, 2006, p.10). Particularly as the economically active population is expected to decrease due to low birth rate (1.08 in 2006) and the aging of the population, this direction cannot be a valid national growth model any more.

We should adopt a model that continues growth by raising productivity. That is, it is desirable to attract additional investments and increase the economic activity participation rate by enhancing the marginal productivity of capital and labor, which entails developing innovative technologies and products.

To accomplish this, the government is promoting various reform policies to salvage the industries trapped in the cycle of low-skill: 'low technology → low productivity → low wage', and transform them into the cycle of 'high technology → high productivity → high wage (See Figure 2).

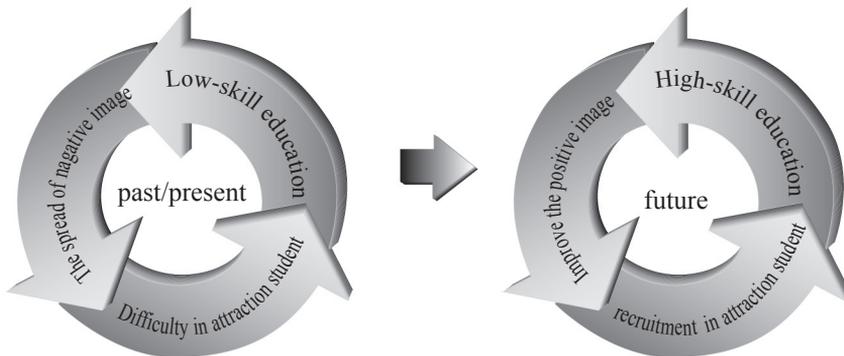


A. Reforming policies for past and present      B. Reforming policies for future

Figure 2. Direction for Reforming Industries from Past and Present to Future

The goal of vocational education at specialized high schools, which educate and supply manpower required by industries, also needs to be reset in tune with the new direction for enhancing the productivity of industries. Like ‘a car without destination and driver,’ the direction of vocational education at specialized high schools, which have trained unskilled technicians, has been out of joint with industrial changes and students’ demand since the 1990s. Therefore, it is indisputable that the goal of vocational education at specialized high school should be reset.

That is, the current vicious cycle of ‘low-skill education → general negative image of specialized high school education → difficulty in attracting new students’ should be switched to the virtuous cycle of ‘high-technology education → positive image of vocational education at specialized high schools → recruitment of adequate students with talents and aptitude in the corresponding areas’.



A. Goals of manpower for past and present      B. Goals of manpower for future  
Figure 3. Goals of Manpower Education at Specialized High Schools Matching the Direction for Reforming Industries

For the turning of the goal of manpower education at specialized high school manpower, the following policies should be promoted.

After graduation from a specialized high school, students need to advance to a higher educational institution, and to refine the practical skills obtained during secondary education and acquire theoretical abilities. Through this policy, the pool of core technology manpower will increase to meet the increased labor demand of the high-technology and high-skill labor market expected by 2020. This direction reflects the already increasingly higher academic achievement of new students at specialized high schools, in particular special-purpose high schools and specialized vocational high schools; therefore these students' demands for higher education can be accommodated by establishing continuous vocational education systems.

Still, however, the low-skill labor market is large in Korea, and the market for unskilled labor is also expected to have an increasing demand for manpower. What is more, there are manpower demands not popular among students but essential for national key industries, which therefore are managed by the state. For these reasons, it is necessary to maintain low-skill manpower training systems in accordance with learners' level and the size of corresponding labor markets.

Accordingly, we suggest two goals of vocational education at specialized high schools. First goal: Establish manpower training systems for the high-skill high-technology labor market. Second goal: Establish manpower training systems which can be adjusted according to learners' level and the size of labor markets. The possible goals of manpower training according to two variables – technology level and students' academic achievement – are suggested as follows.

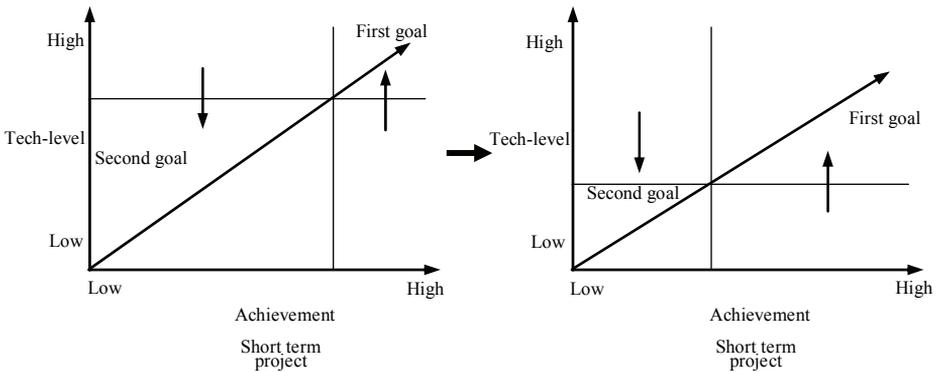


Figure 4. Change of the Goals of Manpower Training According to Technology Demand and Students' Achievement

In case technology level demanded from industries is high (high-skill and high-technology areas) and students' academic achievement is high, the operation of the specialized high school should pursue the first goal, and in case technology level demanded from industries is low (low-skill and low-technology areas) and students'

academic achievement is low, the operation of the specialized high school should pursue the second goal.

Currently at specialized high schools in Korea, the number of students with high academic achievement is relatively small, and there are not many Korean corporations demanding manpower with high technology. Thus, it is necessary to maintain the pattern on the left side of Figure 4 for the short run, and then change the manpower demand and supply model gradually to the pattern on the right side for the long run.

In order to establish such a system, specialized high schools pursuing the first goal need to develop and teach curriculums for continuous study in the same area, and those pursuing the second goal curriculums for working in industries of the same area.

As to the allocation of educational budgets, specialized high schools pursuing the first goal need to reduce budgets because their education is likely to be more theoretical than experimental and practice-oriented. Those pursuing the second goal need to increase educational budgets for their more experimental and practice-oriented education. However, the proportion of educational budgets should be adjusted according to the characteristics of job categories or manpower tasks for which training is needed at the corresponding specialized high schools.

### **Construction of Vocational Education System at Specialized High Schools in Connection to RIS (RHRD)**

To promote balanced national development, we need to design a vocational education system for human resource development that centers on the local innovation system under construction. While maintaining harmony between the internal and external values of vocational education, the future vocational education system should be discussed in the macroscopic framework of industry-government-university cooperation and national human resource development, jointly with related governmental departments including the Ministry of Education and Human Resources Development, the Ministry of Commerce, Industry and Energy, the Ministry of Science and Technology, the Ministry of Labor, the Ministry of Culture and Tourism, the Ministry of Maritime Affairs and Fisheries, the Ministry of Agriculture and Forestry and the Small and Medium Business Administration, local self-governing bodies, and industry and sector councils.

As a part of the local innovation system, the human resource development system of vocational education institutions, including specialized high schools based on industry-university cooperation, is suggested as follows: (a) reestablish the role of specialized high schools as institutions to prepare the education of practical technology manpower as well as professional manpower, backbone technology manpower and high-quality technological manpower in the same areas (e.g. engineering high schools, agricultural engineering high schools); (b) differentiate institutions and curriculums (two-year colleges – professional manpower, four-year universities and industrial universities – backbone technology manpower, graduate schools and above - high-quality technological manpower); (c) strengthen connection among schools of the same area and among industries through agreements; (d) diversify support systems including the

local innovation system (RIS); (e) establish industry-university cooperation systems through the medium of sector councils; (f) realize lifelong education by establishing transition systems from school to work and from work to school; g. develop the virtuous technology innovation cycle of ‘production of talented persons through creative education based on local innovation clusters → R&D → technology evaluation → technology transaction → venture foundation/technology transfer’. This can be expressed in a conceptual diagram as Figure 5.

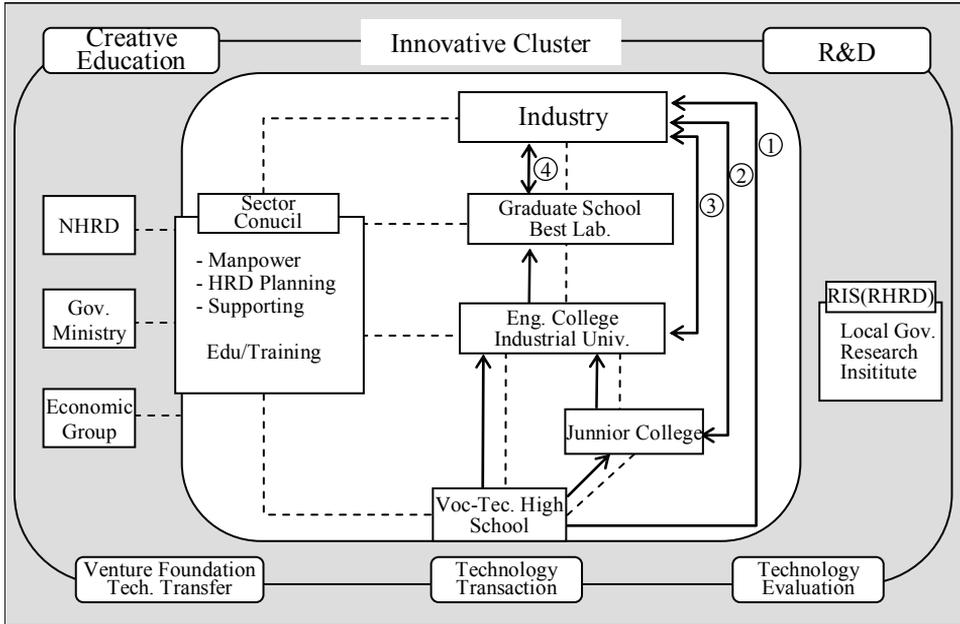


Figure 5. Vocational Education System based on Industry-University Cooperation Linked to Local Innovation System

Note. — Continuous study-working, connection-cooperation-support, ② Means the education and supply of professional manpower, ③ Backbone technology manpower, and ④ High-quality technology manpower

Through diversifying curriculums based on agreements between manpower consumers and suppliers, the vocational education system can produce various types of specialized manpower in small lots. Moreover, as specialized high schools and local self-governing bodies participate in the order-base curriculum operation focused on demands from universities and industries, multi-dimensional core manpower can be educated for the local economy. In addition, order-based curriculums containing field practice and joint use of equipment and materials can be connected to future jobs.

For this, it is necessary to develop by region various career paths highly accessible to local competent persons by establishing consortiums consisting of industrial high schools, universities, two-year colleges, industries, and local self-governing bodies (local innovation system) and such as consortiums will allow specialized high school students to enter universities from two-year colleges without examination by agreement.

In addition, for balance, it is necessary to give priority of support to specialized high schools and two-year colleges that educate backbone technology manpower as well as manpower for areas with labor supply shortage. It is also necessary to operate flexibly while assuring the recruitment of graduates from related education institutions and local self-governing bodies' participation.

For this, it is needed to revise Article 10 (Construction of Local Innovation System) of 'the Special Act on National Balanced Development (January 16, 2006).' According to Article 10, the state and local self-governing bodies are supposed to promote policies on 'the activation of industry-university-research institute cooperation,' 'education of professional manpower for local innovation,' 'activation of exchange and cooperation among universities, corporations, research institutions, non-profit organizations and local self-governing bodies,' etc. in order to build local innovation systems that fit the conditions and characteristics of each locality. Because this law omitted specialized high schools, it needs to be revised to include specialized high schools as the members of local innovation systems.

### **Improvement in the Quality of Specialized High School Teachers, Main Actors in Change**

Different from ordinary high school teachers, the specialized high school teachers need to respond sensitively to changes in the labor market, industrial fields and social demands. However, the preparation of specialized high school teachers in Korea lags behind changes in the industrial world because of structural problems, such as the inflexibility in teacher demand and supply and teacher education programs that are not helpful for strengthening teachers' competence (Lee & Choi, 2005).

In order to activate vocational education at specialized high schools, we need to make plans for specialized high school teachers to reflect changes in industrial fields and social demands immediately in their teaching and to give them opportunities to strengthen their competence. One of the most urgent requirements for the competitiveness of specialized high schools is the teachers' high competence. Only high-level teachers can keep up with the development of knowledge and technology and at the same time educate students as demanded by society.

'Plans to Innovate the Vocational Education System (May 12, 2005)' also emphasized the competence of teachers in special curriculums at industrial high schools as part of change and innovation at individual schools.

As in Figure 6, specialized high school teachers need to accommodate demands from the state, industries, local community, the school, students and parents, to monitor changes not only in the contents and forms of education but also in the career world, society and the labor market, and to reflect such changes in their education.

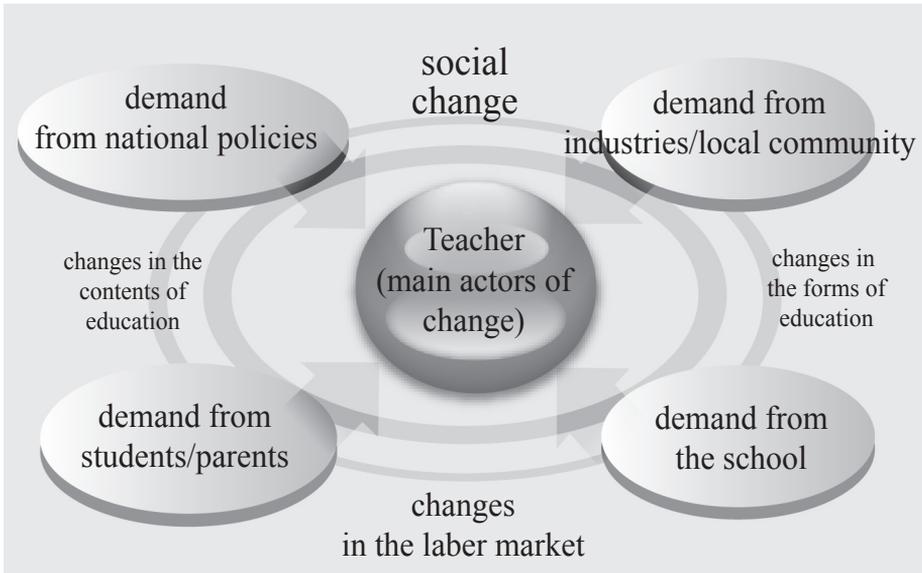


Figure 6. Role Model of Specialized High School Teachers as Main Actors of Change

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# **Research on Higher Vocational and Technical Education in China**

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**ABSTRACT** The history of higher vocational education research in China is relatively short, but we can still classify the development of this research into three periods or stages according to its focus. The first stage (1980s-2000) with its focus on “What is higher vocational education?”, “Why should we develop it?”, and “How should we develop it?”. The second stage (2000-2004) focused on the talents training model and school system reform. The third stage (2004-present) focused upon curriculum Construction for the feature of higher vocational education. This study is based on the overview of books, papers and national research projects on higher vocational education in the past 20 years, with special focus on the research after 2000.

**KEY WORDS** Higher Vocational and Technical Education, School System Reform, Curriculum Construction, China

## **Introduction**

Higher vocational education came into being in China at the beginning of the 1980s, and became well established its position in Chinese higher education by the middle of 1990s, and started its great expansion at the turn of the century. The research of higher vocational education has never been stopped in the past 20 years, in which more than a hundred of books on higher vocational education have been published. With the careful search of the index of China Journal Net, we have found that there are 7,476 articles on higher vocational education, out of which 70% were published after 2000. This indicates that most of the research has been undertaken after 2000, and development of higher vocational education has already attracted the wide attention of Chinese society (Wang, 2004). The history of higher vocational education research is relatively short, but we can still classify the development of this research into three periods or stages according to its focus. This study is based on the overview of books, papers and national research projects on higher vocational education in the past 20 years, with special focus on the research after 2000.

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## **First Stage (1980s-2000) with its Focus on “What is Higher Vocational Education?” “Why Should We Develop It?” and “How Should We Develop It?”**

There were not many publications on higher vocational education before 2000 in comparison with those after 2000, but most of research in this period (1980s-2000) is very much basic to the development of higher vocational education in China. “What is higher vocational education?” “Why and how should we develop it in China?” It was of great significance to understand these basic questions before the actual great expansion of higher vocational education started.

### **Research on the Development Drive for Higher Vocational Education**

Why higher vocational education initiated in the 1980s was widely accepted and began to develop in 1990s in China, became the focal point of the research during this period. It was crucial to understand the necessity and conditions for developing higher vocational education in Chinese economic, social and educational context of 1990s before its actual fast development. Many scholars attributed the demand for higher vocational education to economic development, which required the upgrading of knowledge and skill structure of those working in the front line of production and services. Shi had generalized such drives for higher vocational education development into three factors: (a) economic - development of science and technology and its wide application in production and services requires quality improvement of workers in general in order to meet the needs of economic development for more high skilled workers; (b) social - in light of the serious unemployment situation, to expanding the size of higher vocational education can postpone the time of first employment for some school graduates so as to relieve the employment pressure in labor market and to avoid the social problems which might be caused by high rate of unemployment; (c) educational – in the context of increasingly severe competition for entering the traditional universities, developing higher vocational education can provide another alternative for the school graduate so as to meet the needs of ordinary people for mass higher education. This view held by Shi was relatively rational and later was commonly shared by the academic community in China (Shi, 1998a, 1998b, 1998c).

### **Research on the Intension of Higher Vocational Education**

In 1994, several articles were published in Chinese Vocational and Technical Education, one of the leading journals of TVET in China, discussing the intension, implementation and development of higher vocational education, which indicates the great concern about these issues during the time. It was quite crucial to understand the intension of higher vocational education before its actual great expansion started.

Yang and his associates, thought, “Higher vocational education is mainly higher technical education.” Their argument was based on the talents structure theory. Social talents can be divided into four categories: theoretical talents, engineering talents,

technical talents, and skilled talents. Higher vocational education is mainly to train the technicians with practical skills and the technologists or the frontline managers with specialized expertise. This kind of vocational college could be run either by the government (central or regional), by industry (sectors or enterprises), by social organizations or private institutions, in form of a partnership with foreign investors, or by means of cooperation between various kinds of institutions mentioned so as to mobilize all the resources available in society to develop higher vocational education. This is a relatively complete view on the conception of higher vocational education and the way to develop it. As to the name of such a higher institution for vocational education, the more popular view at that time was to call it a “technical college” or “university of technology”, for the reason that this kind of colleges mainly to train the frontline technicians or managers which was usually understood as “technical education”, and the names as such could be easily understood by the international community (Yang, Meng & Yan, 1995).

Shi thought that higher vocational education should take “higher education” as its “family name” and “vocational education” as its “given name,” based on his fundamental research on higher vocational education (Shi, 1998c). Lu’s view was also quite popular during this period. He defined higher vocational education as a kind of education to train technical talents including academic education for diplomas and technical training for certificates. He asserted that the academic education for diplomas could be as high as the associate degree, bachelor’s degree and could even include the postgraduate level, and that China currently should mainly provide higher vocational education at the associate degree level. Further, he recommended that technical training for certificates should be mainly for vocational and technical qualifications of various kinds, covering large areas of employment (Lu, 1998, p. 29).

In addition to the fundamental research, there were also comparative studies of higher vocational education and its linkage with secondary vocational education during this period. This comparative research mainly focused on the introduction of successful experience in Taiwan and abroad. This research was necessary at a time when China was beginning its development of higher vocational education, and “education borrowing” was the major aim of such comparison. The research projects of the National Educational Science Planning during this period mainly focused on issues like the position of higher vocational education and its linkage with secondary vocational education and with general education, and the basic rules for technological education, and its special features.

## **Second Stage (2000-2004) with its Focus on the Talents Training Model and School System Reform**

After 2000, the higher vocation education in China began its great expansion. In the process, it was commonly recognized that the development of higher vocational education should change its focus from the size expansion to the quality improvement.

In this context, the training model and major construction, in other words, the talents training models of higher vocational education based upon college-industry cooperation, became a focal point of the research during this period. This trend of research continued up till 2004.

From 2002, Ministry of Education (MoE) held three national conferences on production-learning-research combination and cooperation, after which “service-aimed, employment-oriented, production-learning-research combined” became the basic principle and widely recognized pathway for higher vocational education development. Production-learning-research combination was the hottest topic of discussion and research during this period. The book, *Only Pathway: Guideline of Production-Learning-Research Combination for Higher Vocational Education* remarkably reflects the fruitful results of this research (HEDME & CSHE, 2004).

One-third of all the higher vocational education research during this period was about the issue of production-learning-research combination and cooperation. These studies were undertaken from different perspectives of comparative, historical, empirical, and economic. In a word, both theoretical research and practical approaches had been adequately carried out for the talent training model of higher vocational education from different perspectives. Huang concluded that it was a special feature of vocational education to implement the production-teaching combination, which was also the successful experience of vocational education development in China and the basic model and developmental trend of vocational education in the international community (Huang, 2004). This was also true to the production-learning-research combination as the widely recognized talent training model for higher vocational education.

Another focal point for higher vocational education research during the period was the issue of school system. Study on Several Requirements for Further Enforcing the Vocational Education jointly issued by seven ministries of the central government, pointed out that the 2-year system should become the basic system for higher vocational education and should be earnestly implemented in two or three years. This government demand immediately started a national debate. Some scholars thought that it could help higher vocational education in China to form its specific feature if its schooling was to be reduced from 3 years into 2 years, which could change its talent training model and improve its curriculum system. They argued that the introduction of a 2-year system would break through our traditional system so as to form a new system of curriculum and create a better training model for higher vocational education, walking towards a road to success in training of the applied talents. But other scholars worried that changing from 3 years into 2 years might bring negative effects upon higher vocational education. It might lower social status of higher vocational education, increase pressure upon employment, add difficulties to meet the training target, demand more improvement in teacher quality, and raise the running cost for higher vocational colleges. The more popular view was that the length of higher vocational education should be decided by the actual time required to meet the training target for respective majors, and it should be varied rather than unified.

Another controversial issue for the school system was whether we should have a kind of higher vocational education at 4-year college level. Many scholars argued that currently our highest level for higher vocational education in China should still be confined to associate degree level, which is not consistent with international practice. It was of historical significance to introduce higher vocational education up to the bachelor degree level in China. Some suggested that this could be achieved by upgrading a few existing high quality colleges of higher vocational education, while others thought we should establish some new 4-year colleges of higher vocational education, which later could be developed up to postgraduate education. Some scholars pointed out that the process of such upgrading should be strictly controlled so as to ensure the quality of those newly established colleges of technology. In order to avoid losing control over this upgrading process, some scholars suggested that it should be essential to establish the proper qualifying standards for a 4-college of technology, and that the standards should be different from those for a traditional academic university. The development for such standards should thus be taken seriously in the research on higher vocational education (Shi & Xu, 2003).

There was another discussion about the talent training target of higher vocational education. Before 2004, an agreement had already been reached about what kind of skills higher vocational education should offer, i.e. technology application talents. This agreement was broken after the Nanjing Conference in July of 2004, where the talent training target of higher vocational education was re-defined as high-skilled talents. The redefinition conformed to “employment-oriented vocational education” recommended by the MoE. Some thought that skilled talents usually performed practical routine work whose qualification was relatively lower than the technology application talents and they could be trained by secondary vocational education. But others argued that since high-skilled workers were in high demand by society, secondary vocational education could hardly be qualified to accomplish such training tasks, with its current students’ quality and training facilities. Therefore, higher vocational education should undertake this responsibility, and the training target of higher vocational education should also include high-skilled workers, which should be its main task at the moment. Yang and Meng organized a few field studies in enterprises of different sectors or industries, based upon which they redefined the training target for higher vocational education. They thought that higher vocational education should not restrict its training target only to “technology application talents” but the main function of higher vocational education should provide higher technological education, mainly training technicians and technologists. They also argued that: (a) not all the higher education offered at the associate degree level was higher vocational education in nature; (b) for a certain period of time in China, higher vocational education would mainly remain at the associate degree level; and (c) higher vocational education should not restrict itself only to this level (Yang, Meng, Yan & Huang, 1999). This view has been commonly accepted.

The comparative research about higher vocational education during this period was also conducted. For example, the book, *Contemporary Higher Vocational Education: from International Perspective*, covers its historic development, current provisions,

specific features and management systems (Jiang, 2002). In the book, *International Comparative Study of Higher Vocational Education*, points out that the upgrading of higher vocational education institution would make the vocational system more perfect, and the higher vocational education would become an important part of lifelong education, and the relationship between higher vocational education and social/economic development would be closer (Huang, 2003). Kuang's research, *Comparative Study on the Development and Change of Higher Vocational Education*, conducted a relatively complete research in the area of higher vocational education comparison (Kuang, 2005).

### **Third Stage (2004- ) with its Focus on Curriculum Construction for the Feature of Higher Vocational Education**

Since 2004, the focus of higher vocational education research has been changed into its curriculum and instructional model. It has been commonly recognized that curriculum is the key to all the issues in higher vocational education, and that only the curriculum could finally explain the issues of the position, training model and major construction of higher vocational education. The aim of higher vocational education could be explained and should be realized by its curriculum. The Appraisal for Excellent Curriculum initiated by the MoE and the strong desire for specific features in higher vocational education were the direct impetuses for this curriculum reform. How to free from the influence of subject-based curriculum model in traditional universities and emphasize more on practical ability training for students became the focus of this curriculum study during the period. Many papers titled "study on practical training system in higher vocational education" could be included in this approach.

As the direct drive for this curriculum reform was to acquire specific features for higher vocational education in China, scholars in favor tried to establish a kind of higher vocational college curriculum with Chinese flavor. Many colleges of higher vocational education initiated a practical approach to the project-based curriculum. Xu points out that a project-based curriculum should set and organized by task items based on systematic analysis of the working system; therefore, it was relatively comprehensive, complete, independent and different from module curriculum based on skill units, and it should become the right direction of the curriculum reform for higher vocational education (Xu, 2005).

Another important project in this period is *Guidance for Major-Setting and Curriculum Development in Higher Vocational Education*. They tried to develop a new curriculum model and a new method of curriculum design for higher vocational education, based on the existing model by learning the successful experience abroad, especially those in Australia. They pointed out that the curriculum design for higher vocational education should meet the needs of industry and should be employment-oriented and vocational competency-based, and that this kind of curriculum could be called VOCSCUM in short (Gao & Bao, 2004).

## **The Features and Prospects of Higher Vocational Education Research**

The research on higher vocational education in China is relatively fruitful although its history is relatively short. In addition to the research mentioned above, there is also some research that covers other areas of higher vocational education, for example, the teaching staff development, practical training-base construction, and so on. The features of all the research could be generalized as following.

## **The Researches Link to the Development of Higher Vocational Education**

This paper divides research of higher vocational education into 3 fundamental stages. The 3 stages are also the 3 critical periods of higher vocational education development in China, and the focal research issues for each stage are also the major concerns of higher vocational education development during the period. Therefore, the research is almost consistent with every step of its development. Many issues in practice, like the position of higher vocational education, the change of its school system, and its curriculum reform, could immediately attract the attention and cause hot discussion in the academic world, which is the healthy side of higher vocational education research in China.

## **The Research Is Not so Balanced, with More Practical Approach and Less Theoretic Study**

Most of the research on higher vocational education is empirical and practical in forms of experience conclusion or working reports. The theoretical standards need to be improved, especially for the construction of a theoretical system for higher vocational education. Many researchers are more interested in the vocational nature of higher vocational education rather than the nature of higher education; this phenomenon could be explained by the relatively short history of higher vocational education research.

## **A Relatively Independent Research Team of Higher Vocational Education Has Already Come into Being**

It is quite important to have an independent research team to study higher vocational education. Fortunately, this independent team is taking shape, along with the scholars from other areas of research who also care about higher vocational education development. For example, most vocational colleges have established a “Research Institute of Higher Vocational Education” or a “Research Institute of Higher Education,” and many universities have established “higher vocational education research courses” in their doctoral or master’s degree programs, in which a specialized group of researchers on higher vocational education has been trained. In general, this research team of higher vocational education is still relatively weak compared with other areas of research in education, and this professional team needs to be further strengthened in the future.

In conclusion, higher vocational education has already become an important part of higher education as well as important direction of vocational education development in

China. The practice of higher vocational education development demands strengthening its theoretical research and practical approach. The future of higher vocational education research in China need better development of its research team and academic institutions and further upgrading of its standard of theoretical studies, while still sticking to its good tradition of linking theory with practice.

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# **Student Expectations of Teachers' Role at Different School Levels in Taiwan**

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**ABSTRACT** The key to the goal of educational reform lies with teachers, who are the center and the life of education. The success of education depends on the quality of teachers. How well the teachers play their roles is decisive to the success of education. The researchers referred to the literature abroad and in Taiwan, and related questionnaires, and compiled a "Questionnaire on Teacher Role Expectations" to survey students from junior, senior and vocational high schools as well as colleges and universities in Taiwan. 1,450 questionnaires were sent out, and 1,300 were returned, with an 89.66% return rate; the valid ones totaled 1,102, with an 84.77% validity rate. As well as calculating the means and standard deviations, the obtained data were tested with other statistical methods, including the t-test, F-test, ANOVA and Scheffé's post-hoc test. According to analyses, students have higher expectations for teachers to play as a guide to students' life, a shaper of instructional environments, a mediator of students' knowledge, and a knowledge worker. It suggested that the found teacher role expectations can work as references for educators and teacher education institutions. Successful educators may emphasize different roles at different school levels.

**KEY WORDS** Teacher Role Expectations, Philosophical Aspect, Social Aspect, Psychological Aspect, Present-day Need Aspect, Secondary Education, Higher Education

## **Background**

"Excellent," "sophisticated" and "high-quality" education has been the common goal that educational reformers in all countries try to achieve (Bandura, 1986; Barrow, 2002). The society in the new era is one of democratization, liberalization, high-technology, internationalization and informationalization, all of which influence both school education and class organizations. The key to achieve the goal of educational

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reform lies in teachers. The success of education depends on the quality of teachers. How well the teachers play their roles is decisive to the success of education (Birch, 1981; Birch & McCracken, 1982; Bowles, 1971). A school is characterized by an emphasis on high student expectations, school staff cohesiveness, engaging instruction, high parent involvement, and multicultural instruction integrated the curriculum (Brown & Medway, 2007). Increasingly, teacher educators ask new teachers to learn how to elicit and then use students' existing ideas as a basis for helping them form new, more reasoned, more accurate or more disciplined understandings (Hold-Reynold, 2000). Generally, students were satisfied with the course content and teaching methods. It was important the teacher was encouraging and positive and challenged them to speak up in class (Hausler & Pavilainen, 2003). Various strategies are essential to increase teaching effectiveness and decrease stress for the busy preceptor who juggles the roles of teacher and clinician (Burns, 2006). The expectations of the PBL teaching or learning strategy are that it will enable nurses to develop skills required for professional practice including: enquiry, reasoning, interpersonal and lifelong learning skills (Barrow, 2002). Then, we consider the role of ethnic identity in self-exploration and vocational guidance with adolescents (Gushue, 2006).

The researchers referred to the literature at home and abroad, and used related questionnaires, and compiled a "Questionnaire on Teacher Role Expectations" to survey the teacher role expectations among students from junior, senior and vocational high schools as well as colleges and universities in Taiwan, for the psychological aspect, social aspect, philosophical aspect and present-day need aspect (Allport, Vernon & Lindzey, 1965; Arilotta, 1986; Bergem, 1990; Biddle, 1979). The differences existing in the four aspects of "teacher role expectations" among students at different levels were also described and examined. Based on the study results, conclusions and suggestions were proposed for providing references for educators and teacher education institutions.

## **Objectives**

1. To understand student expectations of teachers' role at different school levels.
2. To examine differences of expectations of teachers' role between male and female students.
3. To examine differences of student expectations of teachers' role among students at different school levels.

## **Research Design**

This study applied the theories of philosophy, psychology, society and present-day needs to form the concepts of teacher role expectations. The content of the questionnaire was drafted, and a pilot study was conducted. After the content of the questionnaire was revised, a formal survey was conducted. The basic structure of the study is constructed

using of the “Questionnaire on Teacher Role Expectations,” while the aim is to discuss different teacher role expectations among students from junior, senior and vocational high schools as well as colleges and universities.

## **Subjects**

Based on the principle of cluster sampling, subjects of the study were from 9 junior high schools, with 408 valid samples; 8 senior and vocational high schools, with 337 valid samples; 6 colleges and universities, with 357 valid samples. Subjects were sampled from all the grades in each school.

## **Instrument**

This study applies the “Questionnaire on Teacher Role Expectations,” which follows the theoretical structures of philosophy, psychology, society and present-day needs. The reliability and accuracy of the research instrument reached a significant level. The reliability coefficient in the questionnaire is as follows: the psychological aspect, .89; the social aspect, .88; the philosophical aspect, .87; and present-day need aspect, .85. After the varimax rotation was applied, four factors were obtained, with a total variance of 52.19%.

## **Data Analyses**

Of the 1,450 questionnaires sent out, 1,300 ones were returned, with an 89.66% return rate; the valid ones accounted for 1,102, with an 84.77% validity rate. As well as calculating the means and standard deviations, the obtained data were tested with other statistical methods, including the t-test, F-test, analysis of variance (ANOVA) and Scheffé's post-hoc test. The obtained data were analyzed, while the findings of the statistical results were further analyzed by ANOVA to verify the differences in teacher role expectations among students with different educational backgrounds. When the F-value reached the significant level, the Scheffé post-hoc comparisons were processed.

## **Results**

There are 1,102 valid samples in this study. Among these samples, the ratio of males to females is about 57% to 43%; the ratio of junior high school students, senior and vocational high school students, and college and university students is about 37%, 30%, and 32%.

### **Philosophical Aspect of Teacher Role Expectations**

For the philosophical aspect, the teacher role expectations of sampled students for “guide to students' life” ( $M=3.44$ ,  $SD=1.00$ ) reached the highest value, while “provider of students' eternal values” ( $M=3.13$ ,  $SD=.98$ ), was the lowest. In other words,

students in Taiwan had the highest teacher role expectations for “a guide to students’ life,” which had the highest value, while “a provider of students’ eternal values” the lowest. Table 1 demonstrates mean scores, standard deviations, and results of t-test in detail.

“Guide to students’ life” reached the highest value, probably because of the diversified society, liberalized economy, democratized politics and localized care for the local geography and history as well as the ever- changing educational policies. So students need more guidance from teachers than ever before. In addition, the social values now tend to be more diversified and open. As a result, values have also become more diversified, while it becomes more difficult to gain final conclusions of eternal values. This is perhaps why the teacher’s role of “a provider of students’ eternal values” had the lowest value (Brubacher, 1962; Cullen, 1992).

Table 1  
*Mean Scores, Standard Deviations, and t-test Results of Philosophical Aspect of Teacher Role Expectations by Gender*

Item	Total		Male		Female		t
	M	SD	M	SD	M	SD	
Guide to students’ life	3.44	1.00	3.52	1.00	3.34	0.99	2.98
Inquirer of students’ problems	3.41	1.01	3.46	1.03	3.34	0.97	1.93
Friend of students	3.36	1.01	3.45	1.03	3.23	0.96	3.71*
Cultivator of students’ democratic knowledge	3.37	0.95	3.47	0.97	3.25	0.91	3.87*
Inspirer of students’ rationality	3.32	0.97	3.40	0.99	3.22	0.94	3.23
Provider of students’ eternal values	3.13	0.98	3.19	1.02	3.06	0.92	2.18*
Mediator of classic masterpieces	3.15	0.92	3.18	0.95	3.10	0.89	1.26
Cultivator of social citizens	3.25	0.92	3.27	0.97	3.21	0.85	1.13*
Total	3.30	0.67	3.37	0.69	3.22	0.62	13.78*

\* p<.05

### Social Aspect of Teacher Role Expectations

For the social aspect, the teacher role expectations of sampled students for “shaper of instructional environments” (M =3.25, SD = .92) reached the highest value, while “developer for assisting communities” (M =3.10, SD = .91), the lowest. In other words, for the social aspect, students in Taiwan had the highest teacher role expectations for “shaper of instructional environments,” which had the highest value, while the lowest was “developer for assisting communities.” Table 2 describes the statistical results in detail.

“Shaper of instructional environments” reached the highest value, because the students usually stay in school for more than eight hours a day. A good instructional environment can inspire students’ learning potentials. It can heighten their moral quality

as well as noble thoughts and feelings, and strengthen their learning motivations. Students, as a result, eagerly hope their teachers can play the role of a shaper of instructional environments. "Developer for assisting communities" scored the lowest, mainly because the current education stresses the development of intellect, and the range of knowledge has narrowed. Students, as a result, are not only unfamiliar with, but also unenthusiastic about the development of communities. This drawback should be corrected.

Table 2  
*Mean Scores, Standard Deviations, and t-test Results of Social Aspect of Teacher Role Expectations by Gender*

Item	Total		Male		Female		t
	M	SD	M	SD	M	SD	
Negotiator and coordinator	3.17	0.88	3.21	0.93	3.11	0.82	1.90*
Shaper of instructional environments	3.25	0.92	3.27	0.96	3.24	0.87	0.62*
Developer for assisting communities	3.10	0.91	3.13	0.99	3.06	0.79	1.19*
Reformer for promoting schools	3.14	0.94	3.12	0.92	3.16	0.95	-0.61
Renovator for advancing culture	3.13	0.89	3.12	0.94	3.13	0.81	-0.13*
Communicator of social culture	3.21	0.95	3.24	0.99	3.16	0.88	1.27*
Ideal communicator with students	3.17	1.04	3.25	1.06	3.07	1.00	2.94*
Cares about social problems	3.13	0.93	3.15	0.98	3.10	0.88	0.95*
Corrector of students' sub-culture	3.25	0.94	3.27	1.01	3.24	0.85	0.51*
Total	3.17	0.63	3.20	0.67	3.14	0.58	2.11

\* p<.05

### Psychological Aspect of Teacher Role Expectations

For the psychological aspect, the teacher role expectations of sampled students for "mediator of students' knowledge" (M =3.57, SD = 1.08) reached the highest value, while "student counselor" (M =3.32, SD = .94), was the lowest. In other words, in the psychological aspect, the students had the highest teacher role expectations for "a mediator of student knowledge," which had the highest value, while the lowest was "a student counselor." Table 3 demonstrates mean scores, standard deviations, and results of t-test in detail.

The results suggest that education in Taiwan is mainly designed for higher education. What students attach importance to be the intellectual education focusing on knowledge? This also shows that both schools and teachers do not pay much attention to the guidance and support of students' psychological life (Evans, 1981; Grace, 1978).

**Table 3**  
*Mean Scores, Standard Deviations, and t-test Results of Psychological Aspect of Teacher Role Expectations by Gender*

Item	Total		Male		Female		t
	Mean	SD	Mean	SD	Mean	SD	
Assistant for students to make choices	3.37	1.00	3.44	1.02	3.29	0.98	2.47
Mediator of students' knowledge	3.57	1.08	3.65	1.07	3.47	1.09	2.79
Role model for students	3.38	1.07	3.44	1.09	3.31	1.04	1.96
Provider of students' learning platforms	3.38	1.01	3.43	1.00	3.30	1.02	2.17
Student counselor	3.32	0.94	3.35	0.95	3.27	0.94	1.48
Inspirer of students' learning	3.36	1.00	3.42	1.01	3.29	0.99	2.09
Problem solver	3.39	1.01	3.43	1.03	3.34	0.98	1.45
Class leader	3.55	1.08	3.58	1.09	3.50	1.07	1.12
Adviser for students' research	3.36	0.99	3.38	1.00	3.33	0.98	0.89
Diagnostician of students' problems	3.34	0.96	3.41	0.98	3.24	0.91	2.91*
Counselor of students' behavior	3.44	0.97	3.51	0.97	3.34	0.96	2.89
Total	3.40	0.79	3.46	0.78	3.33	0.79	6.70*

\*p<.05

### Present-day Needs Aspect of Teacher Role Expectations

For the present-day need aspect, the teacher role expectations of sampled students for "knowledge worker" (M =3.27, SD = .93) reached the highest value, while "reformer of social advancement" (M =3.02, SD = .93) was the lowest. In other words, in the present-day need aspect, the students had the highest teacher role expectations for "knowledge worker," which had the highest value, while the lowest was "a reformer of social advancement." Table 4 demonstrates mean scores, standard deviations, and results of t-test in detail.

**Table 4**  
*Mean Scores, Standard Deviations, and t-test Results of Present-day Needs Aspect of Teacher Role Expectations by Gender*

Item	Total		Male		Female		t
	Mean	SD	Mean	SD	Mean	SD	
Manager of students' emotions	3.20	0.99	3.30	1.02	3.07	0.92	3.95*
Reformer of social advancement	3.02	0.93	3.04	0.97	2.99	0.87	0.84*
Shaper of social culture	3.07	0.91	3.08	0.96	3.05	0.84	0.68*
Knowledge creator	3.10	1.00	3.15	1.03	3.04	0.96	1.74
Developer of educational research	3.18	0.95	3.21	0.98	3.15	0.91	1.09
Scholar and expert	3.08	0.93	3.10	0.96	3.05	0.89	0.87
Knowledge worker	3.27	0.93	3.31	0.95	3.22	0.91	1.58
Knowledge manager	3.21	0.95	3.23	0.96	3.17	0.93	1.02
Total	3.16	0.61	3.18	0.68	3.09	0.63	4.72*

\*p<.05

Present-day society has now entered the era of knowledge management. Teachers can no longer only play roles of knowledge instructors, but almost be knowledge workers themselves. The role of “a reformer of social advancement” scored the lowest, largely because the position of teachers now has become less significant. In addition, they are no longer as highly respected by people in the society as before. For students, as a result, teachers have become less capable in playing the role of a reformer of social advancement (Hamilton, 1984; Heck & Williams, 1984).

**Differences in the Philosophical Aspect**

As to “guide to students’ life,” the mean of sampled junior high school students is 3.66 (SD = .97); senior and vocational high school students, 3.65 (SD = .85); college and university students, 3.44 (SD = 1.00), all of which reach statistical significance (F = 58.15, p < .05).

Table 5  
*Mean Scores, Standard Deviations, and ANOVA Results of Philosophical Aspect of Teacher Role Expectations by School Level*

Item	School Level	Mean	SD	F	Scheffé		
					①	②	③
Guide to students’ life	Junior high	3.66	0.97	58.15*			*
	Senior & voc. high	3.65	0.85				*
	College	3.44	1.00				
Inquirer of students’ problems	Junior high	3.65	0.97	63.26*			*
	Senior & voc. high	3.61	0.81				
	College	2.94	1.05				
Friend of students	Junior high	3.55	1.05	31.73*			*
	Senior & voc. high	3.47	0.94				*
	College	3.02	0.93				
Cultivator of students’ democratic knowledge	Junior high	3.54	0.93	46.70*			*
	Senior & voc. high	3.58	0.83				*
	College	2.99	0.96				
Inspirer of students’ rationality	Junior high	3.49	1.00	31.60*			*
	Senior & voc. high	3.47	0.86				*
	College	3.00	0.97				
Provider of students’ eternal values	Junior high	3.18	1.08	4.50*			
	Senior & voc. high	3.21	0.87				*
	College	3.01	0.95				
Mediator of classic masterpieces	Junior high	3.21	1.00	7.21*			*
	Senior & voc. high	3.25	0.84				*
	College	3.00	0.89				
Cultivator of social citizens	Junior high	3.35	0.92	16.81*			*
	Senior & voc. high	3.36	0.88				*
	College	3.02	0.91				
Total	Junior high	3.45	0.65	62.68*			*
	Senior & voc. high	3.44	0.56				*
	College	3.00	0.67				

Note. 1=Junior high schools, 2=Senior and vocational high schools, 3=Colleges and universities  
 \* p<.05

After the Scheffé post-hoc test was conducted, it was found that the means among students from junior, senior and vocational high schools are significantly higher than that of college and university students. Thus, it can be concluded that students from junior, senior and vocational high schools need more guidance in life from their teachers.

For “friend of students,” the mean of sampled junior high school students is 3.55 (SD = 1.05); senior and vocational high school students, 3.47 (SD = .94); college and university students, 3.02 (SD = .93), which reach the statistical significance ( $F = 31.73$ ,  $p < .05$ ). After the Scheffé post-hoc test was conducted, it was found that the means among students from junior, senior and vocational high schools are significantly higher than that of college and university students. Thus, it can be concluded students from junior, senior and vocational high schools prefer to treat teachers as their friends.

For “provider of students’ eternal values,” the mean of sampled junior high school students is 3.18 (SD = 1.08); senior and vocational high school students, 3.21 (SD = .87); college and university students, 3.01 (SD = .95), which reach statistical significance ( $F = 4.50$ ,  $p < .05$ ). After the Scheffé post-hoc test was conducted, it is found the means among students from junior, senior and vocational high schools are significantly higher than college and university. Thus, it can be inferred students from junior, senior and vocational high schools aim for pursue eternal values. Table 5 describes the statistical results in detail.

### **Differences in the Social Aspect**

For “negotiator and coordinator,” the mean of sampled junior high school students is 3.25 (SD = .96); senior and vocational high school students, 3.24 (SD = .79); college and university students, 3.02 (SD = .85), which reach the statistical significance ( $F = 7.85$ ,  $p < .05$ ). After the Scheffé post-hoc test was conducted, it is found the means among students from junior, and senior and vocational high schools are significantly higher than college and university students. Thus, it can be inferred compared to college and university students, students from junior, senior and vocational high schools need more support from their teachers in negotiation and coordination.

Regarding “shaper of instructional environments,” the mean of sampled junior high school students is 3.40 (SD = .94); senior and vocational high school students, 3.33 (SD = .83); college and university students, 3.01 (SD = .93), which all reach statistical significance ( $F = 19.73$ ,  $p < .05$ ). After the Scheffé post-hoc test was conducted, it is found the means among students from junior, senior and vocational high schools are significantly higher than college and university students. Thus, it can be inferred that compared to college and university students, junior, senior and vocational high school students attach more importance to creating instructional environments.

Regarding “reformer for promoting schools,” the mean of sampled junior high school students is 3.24 (SD = .99); senior and vocational high school students, 3.18 (SD = .85); college and university students, 2.99 (SD = .93), which all reach statistical significance ( $F = 7.02$ ,  $p < .05$ ). After the Scheffé post-hoc test was conducted, it is found the means among students from junior, senior and vocational high schools are significantly higher than college and university students. Thus, it can be inferred that

compared to college and university students, junior, senior and vocational high school students pay more attention to school innovation. Table 6 demonstrates mean scores, standard deviations, and results of ANOVA in detail.

Table 6  
*Mean Scores, Standard Deviations, and ANOVA Results of Social Aspect of Teacher Role Expectations by School Level*

Item	School Level	Mean	SD	F	Scheffé		
					①	②	③
Negotiator and coordinator	Junior high	3.25	0.96	7.85*			*
	Senior & voc. high	3.24	0.79				*
	College	3.02	0.85				
Shaper of instructional environments	Junior high	3.40	0.94	19.73*			*
	Senior & voc. high	3.33	0.83				*
	College	3.01	0.93				
Developer for assisting communities	Junior high	3.08	1.00	0.88			
	Senior & voc. high	3.15	0.84				
	College	3.07	0.87				
Reformer for promoting schools	Junior high	3.24	0.99	7.02*			*
	Senior & voc. high	3.18	0.85				*
	College	2.99	0.93				
Renovator for advancing culture	Junior high	3.16	0.96	2.17			
	Senior & voc. high	3.17	0.83				
	College	3.04	0.86				
Communicator of social culture	Junior high	3.32	1.00	13.21*			*
	Senior & voc. high	3.28	0.86				*
	College	3.00	0.93				
Ideal communicator with students	Junior high	3.18	1.14	2.64			
	Senior & voc. high	3.26	0.98				
	College	3.08	0.95				
Cares about social problems	Junior high	3.16	1.04	5.88*			*
	Senior & voc. high	3.22	0.86				*
	College	2.99	0.87				
Corrector of students' sub-culture	Junior high	3.37	1.00	14.82*			*
	Senior & voc. high	3.34	0.87				*
	College	3.03	0.91				
Total	Junior high	3.24	0.64	2.28*			*
	Senior & voc. high	3.23	0.59				*
	College	3.03	0.63				

Note. 1=Junior high schools, 2=Senior and vocational high schools, 3=Colleges and universities  
 \* p<.05

**Differences in the Psychological Aspect**

Table 7 describes the statistical results in detail.

Table 7  
*Mean Scores, Standard Deviations, and ANOVA Results of Psychological Aspect of Teacher Role Expectations by School Level*

Item	School Level	Mean	SD	F	Scheffé		
					①	②	③
Assistant for students to make choices	Junior high	3.51	1.00	52.01*			*
	Senior & voc. high	3.65	0.83				*
	College	2.96	1.02				
Mediator of students' knowledge	Junior high	3.92	0.91	25.39*			*
	Senior & voc. high	3.87	0.82				*
	College	2.90	1.17				
Role model for students	Junior high	3.58	1.09	4.84*			*
	Senior & voc. high	3.57	0.93				*
	College	2.97	1.06				
Provider of students' learning platforms	Junior high	3.62	0.97	6.34*			*
	Senior & voc. high	3.57	0.84				*
	College	2.92	1.05				
Student counselor culture	Junior high	3.46	0.98	22.23*			*
	Senior & voc. high	3.42	0.80				*
	College	3.05	0.96				
Inspirer of students' learning	Junior high	3.58	0.94	5.49*			*
	Senior & voc. high	3.54	0.86				*
	College	2.94	1.06				
Problem solver	Junior high	3.55	0.99	36.75*			*
	Senior & voc. high	3.58	0.90				*
	College	3.03	1.03				
Class leader	Junior high	3.84	1.01	85.94*			*
	Senior & voc. high	3.80	0.94				*
	College	2.97	1.06				
Advisor for students' research	Junior high	3.61	0.93	55.34*			*
	Senior & voc. high	3.51	0.79				*
	College	2.93	1.08				
Diagnostician of students' problems	Junior high	3.55	0.92	45.29*			*
	Senior & voc. high	3.49	0.87				*
	College	2.96	0.96				
Counselor of students' behavior	Junior high	3.66	0.94	6.47*			*
	Senior & voc. high	3.64	0.82				*
	College	3.00	0.99				
Total	Junior high	3.63	0.69	91.38*			*
	Senior & voc. high	3.60	0.63				*
	College	2.96	0.84				

Note. 1=Junior high schools, 2=Senior and vocational high schools, 3=Colleges and universities  
 \* p<.05

For “assistant for students to make choices,” the mean of sampled junior high school students is 3.51 (SD = 1.00); senior and vocational high school students, 3.65 (SD = .83); college and university students, 2.96 (SD = 1.02), which reach statistical significance ( $F = 52.01, p < .05$ ). After the Scheffé post-hoc test was conducted, it is found the means among students from junior, and senior and vocational high schools are significantly higher than college and university students. Thus, it can be inferred that compared to college and university students, junior, senior and vocational high school students are more likely to regard their teachers as assistants whenever making choices.

For “mediator of students' knowledge,” the mean of sampled junior high school students is 3.92 (SD = .91); senior and vocational high school students, 3.87 (SD = .82); college and university students, 2.90 (SD = 1.17), which all reach statistical significance ( $F = 25.39, p < .05$ ). After the Scheffé post-hoc test was conducted, it is found the means among students from junior, and senior and vocational high schools are significantly higher than college and university students. Thus, it can be inferred that compared to college and university students, junior, senior and vocational high school students are more likely to regard their teachers as mediators of knowledge.

For “counselor of students' behavior,” the mean of sampled junior high school students is 3.66 (SD = .94); senior and vocational high school students, 3.64 (SD = .82); college and university students, 3.00 (SD = .99), which all reach statistical significance ( $F = 6.47, p < .05$ ). After the Scheffé post-hoc test was conducted, it is found the means among students from junior, and senior and vocational high schools are significantly higher than college and university students. Thus, it can be inferred that compared to college and university students, junior, senior and vocational high school students are more likely to regard their teachers as counselors of their behaviors.

### **Differences in the Present-day Needs Aspect**

For “manager of students' emotions,” the mean of sampled junior high school students is 3.29 (SD = 1.05); senior and vocational high school students, 3.39 (SD = .92); college and university students, 2.91 (SD = .91), which all reach statistical significance ( $F = 24.27, p < .05$ ). Thus, it can be inferred that compared to college and university students, junior, senior and vocational high school students need their teachers more in teaching them emotional management.

For “developer of educational research,” the mean of sampled junior high school students is 3.31 (SD = .96); senior and vocational high school students, 3.26 (SD = .83); college and university students, 2.98 (SD = .96), which all reach statistical significance ( $F = 13.09, p < .05$ ). Thus, it can be inferred that compared to college and university students, junior, senior and vocational high school students have higher expectations for their teachers to play the role of developers of educational research.

For “knowledge manager,” the mean of sampled junior high school students is 3.32 (SD = 1.01); senior and vocational high school students, 3.34 (SD = .88); college and university students, 2.94 (SD = .90), which all reach the statistical significance ( $F = 2.73, p < .05$ ). After the Scheffé post-hoc test was conducted, it is found that the means among students from junior, senior and vocational high schools are significantly higher

than college and university students. Thus, it can be inferred that compared to college and university students, junior, senior and vocational high school students have higher expectations for their teachers to play the roles of knowledge managers. Table 8 describes the statistical results in detail

Table 8  
*Mean Scores, Standard Deviations, and ANOVA Results of Present-day Needs Aspect of Teacher Role Expectations by School Level*

Item	School Level	Mean	SD	F	Scheffé		
					①	②	③
Manager of students' motions	Junior high	3.29	1.05	24.27*			*
	Senior & voc. high	3.39	0.92				*
	College	2.91	0.91				
Reformer of social advancement	Junior high	3.01	0.96	0.23			
	Senior & voc. high	3.04	0.94				
	College	3.00	0.88				
Shaper of social culture	Junior high	3.08	0.98	1.12			
	Senior & voc. high	3.12	0.86				
	College	3.01	0.86				
Knowledge creator	Junior high	3.14	1.09	2.78			
	Senior & voc. high	3.17	0.95				
	College	3.00	0.94				
Developer of educational research	Junior high	3.31	1.00	13.09*			*
	Senior & voc. high	3.26	0.83				*
	College	2.98	0.96				
Scholar and expert	Junior high	3.10	0.99	2.46			
	Senior & voc. high	3.15	0.87				
	College	3.00	0.91				
Knowledge worker	Junior high	3.47	0.89	36.04*			*
	Senior & voc. high	3.38	0.84				*
	College	2.94	0.98				
Knowledge manager	Junior high	3.32	1.01	2.73*			*
	Senior & voc. high	3.34	0.88				*
	College	2.94	0.90				
Total	Junior high	3.21	0.66	22.20*			*
	Senior & voc. high	3.23	0.62				*
	College	2.97	0.63				

Note. 1=Junior high schools, 2=Senior and vocational high schools, 3=Colleges and universities  
\*p<.05

## Conclusions and Suggestions

### Conclusions

Students have higher expectations for teachers to play the following roles: “a guide to students’ life,” “a shaper of instructional environments,” “a mediator of students’ knowledge,” and “a knowledge worker.” Compared to college and university students, students from junior, senior and vocational high schools attach more importance to the teacher role expectations in the philosophical, social, psychological, and present-day need aspects.

Compared to college and university students, students from junior, senior and vocational high schools have higher expectations for their teachers to play the following roles: “a guide to students’ life,” “an inquirer of students’ problems,” “a friend of students,” “a developer of students’ democratic knowledge,” “an inspirer of students’ rationality,” “a mediator of classic masterpieces,” and “a developer of social citizens,” while in compared with students in colleges and universities, senior and vocational high school students have higher expectations for their teachers to play the role of “providers of students’ eternal values.”

For the social aspect, students in junior, senior and vocational high schools have higher expectations for their teachers to play the following roles: “a negotiator and coordinator,” “a shaper of instructional environments,” “a reformer for promoting schools,” “a communicator of social culture,” “concerned with social problems,” and “a corrector of students’ sub-culture.”

For the psychological aspect, students in junior, senior and vocational high schools have higher expectations for their teachers to play the following roles: “a mediator of students’ knowledge,” “a problem solver,” “an assistant for students to make choices,” “an adviser for students’ research,” “a class leader,” “a provider of students’ learning platforms,” “a counselor of students’ behavior,” “an inspirer of students’ learning,” “a student counselor,” “a diagnostician of students’ problems,” and “a role model for students.”

For the present-day need aspect, students in junior, senior and vocational high schools have higher expectations for their teachers to play the following roles: “a manager of students’ emotions,” “a developer of educational research,” “a knowledge worker,” and “a knowledge manager.”

### Suggestions

Teacher role expectations are in response to students’ needs; this can serve as a reference for educators and teacher education institutions. The results of this study reveal teacher role expectations among students include the four categories: philosophical, social, psychological and present-day needs. Educators should play more fully rounded roles when teaching students at different school levels (Allport, Vernon & Lindzey, 1965; Holt-Reynolds, 2000; Linton, 1963).

This study points out the variable, “students at different school levels” in Taiwan, reaches significant levels of differences in all the four aspects, namely, the philosophical

aspect, the social aspect, the psychological aspect and present-day need aspect. Teachers, therefore, should play more full roles in instructing their students (Allport, Vernon & Lindzey, 1965; Arilotta, 1986; Voltz, 1989; Warton, Godnow & Bowes, 1992).

Teachers should mainly apply the roles in the “psychological aspect” to guide and help their students. According to the research results, students have the highest expectations for teachers' roles in the psychological aspect. For the psychological aspect, all of the means among all the student groups in the study, including junior, senior and vocational high school as well as college and university students, scored high. This shows all students believe that teacher role expectations in the psychological aspect are very important. Teachers, therefore, should mainly apply the roles in the psychological aspect to guide and assist their students (Allport, Vernon & Lindzey, 1965; Wiener, 1988; Wiersma, 1971; Wu, 1994).

Teachers should be strengthened by training in diverse thinking to teach their students how to bravely face challenges. This study shows that students believe that teacher role expectations in the philosophical, social, psychological and present-day need aspects have a great influence on them. Thus, it is clear that in the democratized, liberalized, open, technological, internationalized, informationalized and new-aged society, teachers need to play diverse roles, and should be strengthened by their own trainings in diverse thinking to equip their students with the ability to bravely face challenges in the future society (Allport, Vernon & Lindzey, 1965; Arilotta, 1986; Habermas, 1987; Zandon, 1993; Zeichner & Gore, 1990).

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# **Introduction and Management of the Cooperative Employment Agreement Program among Vocational High Schools, Junior Colleges and Industries in Korea**

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**ABSTRACT** The purpose of this paper was to explore the Cooperative Employment Agreement Program (CEAP, also known as *Chui-Up-Yak-Jyung-Je* in Korean) among vocational high schools, junior colleges, and industries since 2006. The CEAP is a new innovative approach to improve the career path for graduates of vocational high schools to either employment or college education. It focuses on aligning vocational curricula with related careers in a specific field, and should be operated in a consortium consisting of the representatives from vocational high schools, junior colleges, and industries within the same field. The CEAP has been conducted in the following five processes: establishing the basis, organizing a consortium and plan, developing the program, operating the program, and evaluating the program. Two models for the CEAP were guided; Model 1 is the Combining Employment and College Education (CECE); Model 2 is the Employment after College Education (EaCE). So far, the participants responded that their attitudes toward the CEAP and its expected effects were both positive. Although it has been underway in a demonstrative project, however, the five major issues for better management were identified and should be dealt with.

**KEY WORDS** Cooperative Employment Agreement Program, Vocational High School, Junior College, Industry, Korea

## **Introduction and Background**

In Korea, vocational education has greatly contributed to fostering a skilled workforce of the size needed for economic and industrial development, but criticism continuously arises that vocational education has not responded to changes in the economic environment or the rapid advancement of knowledge and technology. The Presidential Committee on Education Innovation (PCEI), which was established in July 2003, formed a task force "Innovation in Vocational Education" team. The PCEI

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publicly announced the "Plan of Vocational Education System Innovation (PVESI)" as an item of the national agenda.

According to the PVESI (Presidential Committee on Education Innovation, 2005), the goal of PVESI is to enhance the vocational competencies throughout one's life by restructuring the vocational education system which enables students to interchange between going to work from school and back to school from work. To achieve the goal, several tasks for secondary vocational education are suggested, such as building prestigious specialized vocational high schools directly related to industrial demands, strengthening basic vocational education in general vocational high schools, and supporting school-based reforms.

The Cooperative Employment Agreement Program (CEAP) is a new innovative approach to improve the career path for graduates of vocational high schools to either employment or college education. It is also proposed by industries as a means to activate the work-to-school program. The CEAP came about as a result of a need to establish a close cooperative network among industries, education, and training institutes in order to develop the skilled workforce demanded, as well as to provide work-to-school opportunities for continuous self-development in a life-long learning environment. The CEAP focuses on the development and operation of the vertically-aligned vocational courses among vocational high schools and junior colleges, thereby resolving redundancy problems in education and training that have occurred so far.

The Ministry of Education and Human Resources Development initiated the CEAP in 2006, and selected 44 consortiums - 18 Model 1, Combining Employment and College Education, and 26 Model 2, Employment after College Education - through public recruitment and review processes. In total, 40 junior colleges, 150 vocational high schools, and 326 industries were participating among the selected 44 consortiums. For 2006, the Ministry of Education and HRD funded a total of 9,915 million won. All the CEAP consortiums organized the National Operation Council for the Cooperative Employment Agreement Program (NOCCEAP), which form the networks and host cooperative employment agreement program-related workshops.

Meanwhile, the Ministry of Education and Human Resources Development announced "Strategies for Fostering Vocational High Schools in Order to Realize Hopes" in February, 2007 (Ministry of Education and Human Resources Development, 2007) and proposed tasks to suggest life-long visions from getting a job after graduation to getting a bachelor degree. In particular, in order to exponentially expand the opportunities for vocational high school graduates to enter junior colleges and receive academic degrees, the Ministry announced that the CEAP would expand.

Although the CEAP has been underway in a demonstrative project and has also quantitatively expanded, criticisms are made about the shortage of qualitative changes to resolve problems in cooperative programs including the old 2+2 articulation program. Therefore, the purpose of this paper was to explore the CEAP among vocational high schools, junior colleges, and industries since 2006. The specific research questions were addressed as the following: What are the essential components and basic models for the CEAP? What are basic management and evaluation of the 2006 CEAP? What are the

major issues facing the CEAP and possible measures to cope with those issues for better management?

## **Essentials of and Basic Models for the CEAP**

### **Goals and Concepts of the CEAP**

The goal of the CEAP is to operate a customized educational program based on cooperation, to reduce unnecessary overlaps or inefficiency in education by aligning the curricula among secondary and higher education levels, and to produce vocational education systems to foster professionals with high on-site adaptability. The CEAP is different from the past 2+2 articulation program (also known as the 2+2 tech prep) adopted in 1997. However, the past 2+2 articulation programs had failed due to loosened alignment between vocational high school and junior college and a lack of effective industrial participation (Ahn et al., 2001; Lee, 2005).

To oppose this background, the CEAP should be operated in a consortium, which consists of the representatives from junior colleges, vocational high schools, industries, and local governments (general local governments, city, and provincial education offices). This plan results in an active participation of industries, based on employment contracts, credit transfers among vocational high schools and junior colleges, and alignment with the specialized industries within a region.

As shown in Table 1, there are similarities and differences between the old 2+2 articulation program and the CEAP. Both have focused on providing quality college education through the partnership between junior colleges and vocational high schools for students. However, the 2+2 articulation did not guarantee graduates employment upon graduation while the CEAP provides both employment and college education by involving the industries wanting to hire the graduates who successfully completed the articulated program.

Although the existing 2+2 articulation tried to deal with the transitional problem of vocational high school graduates going into college education, it still has failed to solve the problem due to lack of weak alignment in the curriculum and operation by the centered-approach junior college rather than a collaborative one. In addition, the 2+2 articulation program focused on providing special programs, such as special-lecture series, extra-curricular activities, or student clubs, instead of providing the formal or regular curriculum and courses (Jang et al., 1999).

In addition, the junior college in the 2+2 articulation program alone used the total budget. The CEAP budget should be used in a consortium and should allot some portion of the government fund to the participating vocational high schools in order to activate their roles in the operation: more than 50 percent of the government fund in the Model 1 consortium and more than 30 percent in the Model 2 should directly go to the vocational high schools. This budget can be freely used by vocational high schools for the purpose of the CEAP.

Table 1  
*Comparisons of the 2+2 Articulation Program and the CEAP*

Criterion	2+2 Articulation Program	CEAP
Goals	College education/ Associate degree	Employment College education / Associate degree
Program unit	Multiple departments or the school	Single department or program unit
Program model	2+2 curriculum	Model 1: Combing Employment & College Education (CECE) Model 2: Employment after College Education (EaCE)
Partners/ Institutes	Single junior college More than one vocational high school	Single Junior College More than single vocational high school, Industries, and /or Local governments including provincial offices of education
Student size	Unlimited	Minimum 20 students per consortium (minimum 5 students per vocational high school)
Participation of industries	Not required	Required Customized curriculum participated by industries in the same job category, inducing students to be employed after completing the program
Partnership scopes	Develop and implement the articulation curriculum Develop the textbooks	Participate in systematic curriculum development Exchange human and physical resources Build the systems for student recruitment, career guidance, and early graduation for top students
Operation body	Operated by the junior college alone	Operated by a consortium The operation committee consisting of the representatives from the junior college, vocational high schools, industries or local governments
Budget distribution	Not required	More than 50 % of the government fund in Model 1 and more than 30% in Model 2 should directly go to vocational high schools.

**Organizing a Consortium and Its Institutions’ Roles**

The CEAP is a governmental support program that is operated in a consortium, consisting of vocational high schools, junior colleges, and industries in a specific field. In order to form a consortium, both one junior college and two or more vocational high schools must have the same departments because the unit, applying for government CEAP funding is the department. The number of students who participate in a CEAP ranges from 20 to 40. Several vocational high schools and industries can participate in a consortium, however, each vocational high school must have at least five students who would like to participate in the CEAP.

Table 2 shows the roles of institutions participating in a consortium. A vocational

high school plays a role to conduct public relation activities, to recruit students, to plan teacher in-service training, to develop a customized curriculum and textbooks in cooperation with junior colleges based on the advice of industries. Meanwhile, junior colleges also need to recruit the students for the CEAP, to develop a curriculum and textbooks, to support student’s major related-club activities, to operate and manage the programs, and to provide the education programs on commission. Industries provide supports to enable on-site-oriented curriculum by operating supervised occupational experience programs and dispatching industry-school teachers. Meanwhile, local governments play the roles of integrating and coordinating of participants in a consortium.

Table 2  
*Roles of Different Institutions in a Consortium*

Vocational High Schools	Junior Colleges	Industries	Local Governments
Public relations and student recruitment	Development and implementation of a customized curriculum	Joint participation in curriculum and textbook development	Integration and coordination functions among participants
Development and implementation of a customized curriculum	Development of textbooks	Providing supervised occupational experiences	Subsidizing matching funds for the CEAP
Development of textbooks	Support for student major related-clubs	Offering scholarships	
Planning for teacher in-service training	Providing educational programs requested by the schools	Providing in-industry teacher training	
Providing job guidance		Providing equipment and facilities	
		Dispatching workers as part-time teachers to schools	
		Hiring graduates upon completion of CEAP	

Source: Na et al. (2006). p.30.

In addition, each institution benefits from its own roles and participation. Vocational high schools can no longer be mere institutes, training a low-level technical workforce; rather they can provide education opportunities for students to develop as professionals based on the agreed-upon curriculum developed by the consortium. As for junior colleges, they can come up with measures to secure better students who have competency in the given fields and can resolve problems related to "mismatching" in the supply-demand structure. Meanwhile, for industries, they can present their recruitment criteria and either request or demand their requirements in each company by participating in the curriculum development process, thereby selecting top talents and reducing the initial training costs. Lastly, local governments can support vocational high schools, junior colleges, and industries in their regions, fostering top personnel in their regional economy, thereby contributing to the regional development plans.

**Basic Models for the CEAP**

There are two basic models for the CEAP given by the Education Ministry: Model 1

or so-called Combining Employment and College Education (CECE) is that graduation of a vocational high school leads to employment at an industry as well as entrance to a junior college and Model 2 or Employment after College Education (EaCE) is that graduation from a vocational high school leads to entrance to a junior college and employment at an industry respectively. Even if a consortium must choose one model in order to apply for funding, the consortium can still develop its unique CEAP program.

**Model 1: Combining Employment and College Education (CECE)**

A diagram of the CEAP Model is shown in Figure 1. In a Model 1, students would work at an industry after graduation from a vocational high school, and at the same time, they enter into a junior college where they may complete a curriculum via night and weekend courses or on-line courses. A vocational high school should play a role to recruit students for participating in the CEAP to sign a contract with a prestigious industry where people want to work, and to operate a special-employment-guidance program for those senior students based on the curriculum alignment with a junior college. The Model 1 is preferred by vocational high schools, partly because the financial support of the Ministry of Education and HRD should be more allotted to vocational high schools than that of the Model 2.

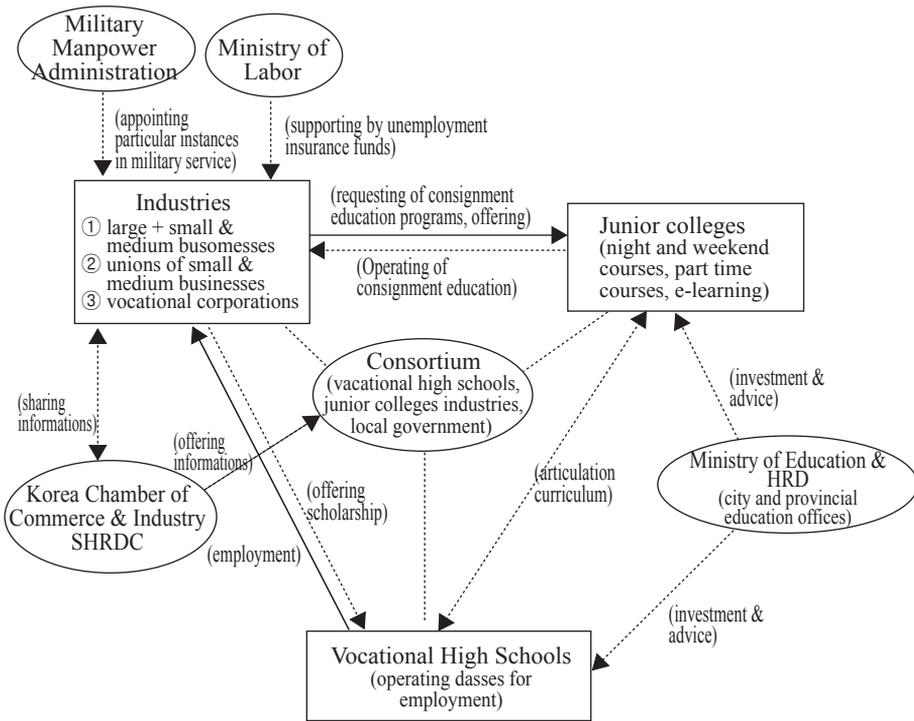


Figure 1. A Diagram of the CEAP Model 1 - Combining Employment & College Education

Source: Na et al. (2006). p.8.

**Model 2: Employment after College Education (EaCE)**

A diagram for the CEAP Model 2 is shown in Figure 2. In the Model 2, when the CEAP students graduate from a vocational high school, they will be admitted to a junior college without taking an exam based on the agreement. After graduation of the junior college, they will be employed as regular workers at a cooperative industry. In this model therefore, it is very important to manage an articulation curriculum by integrating the second and third years in vocational high school and the two years in junior college. This model requires concord among curriculum of vocational high schools and junior colleges curriculum and allows student to enter a junior college without an entrance exam.

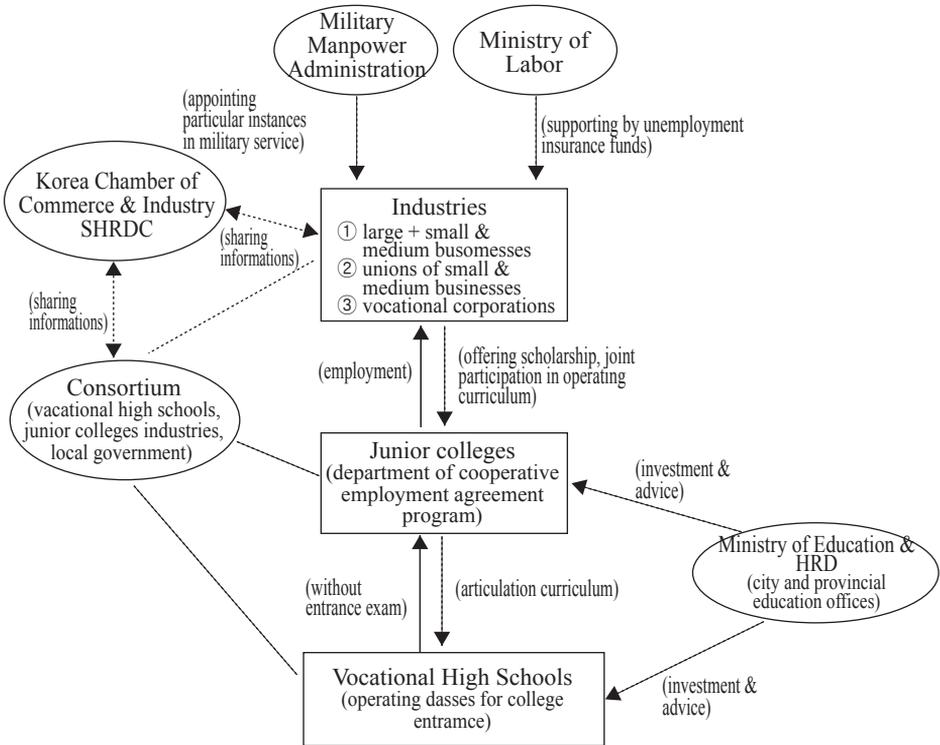


Figure 2. A Diagram of the CEAP Model 2 - Employment after College Education

Source: Na et al. (2006). p.9.

**Management Processes of the CEAP**

The CEAP is managed in five processes as shown in Figure 3: establishing the basis, organizing a consortium and a plan, developing the program, operating the program, and evaluating the program (Na et al., 2006). The first process is to establish the basis for the program. That is, either a vocational high school or a junior college should

identify the needs and feasibility of a CEAP to set its development directions and to diagnose the surrounding environment for the CEAP. The second process, which refers to organizing a consortium and plan, includes forming a consortium, developing a unique CEAP model, deciding contract contents and roles among participant institutions, planning the CEAP, and writing a proposal for funding. The third process, which refers to developing the specific programs, involves in developing an articulated curriculum between vocational high schools and a junior college based on the needs of industries and employers, developing textbooks and materials, developing supervised occupational experience programs, planning consignment educational programs, and planning faculty training and preparation. The fourth process, which is called operating the program, includes operating a consortium, using the budget, preparing and securing faculty and staff, recruiting students, and keeping students for the CEAP. The final process is the overall evaluation process, which is classified into planning for an evaluation, implementing the evaluation, and summarizing the results and giving feedback.

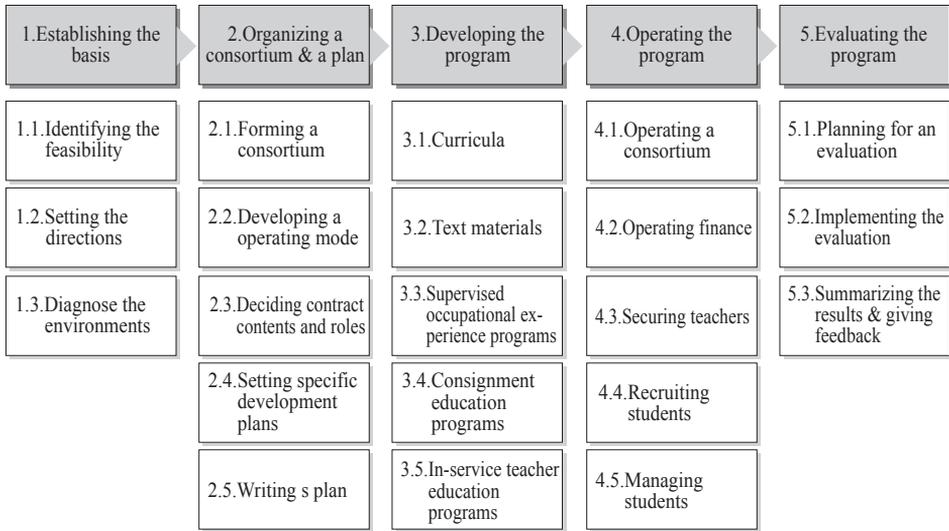


Figure 3. Management Processes of the CEAP

**Management and Evaluation of the 2006 CEAP**

Table 3 shows the areas, fields, and sizes of the CEAP consortiums by their program models and departments, funded by the Ministry of Education and Human Resource Development in 2006. There were selected 44 teams (18 CECE and 26 EaCE) through public recruitment and review processes. In total, 40 junior colleges, 150 vocational high schools, and 326 industries were participating among the selected 44 consortiums. A total of 9,915 million won was funded.

The areas and fields of the Model 1, CECE, were similar to those of the Model 2,

EaCE. However, there were some differences between the Model 1 teams and the Model 2 teams in terms of average amount of funding and the number of the vocational high schools and industries: The average amount of funding in the Model 1 teams was much larger than that of the Mode 2 teams (296,667 vs. 175,967 respectively), but the average number of vocational high schools in the Model 1 teams was smaller than that of the Model 2 teams (2.89 vs. 3.65 respectively). In addition, the number of teams having only one vocational high school or industry was 7 in only ‘industry’ area of the Model 1, but 6 in the three areas in the Model 2.

Table 3  
*Areas, Fields and Sizes of the 2006 CEAP Teams*

Model	Area	Department/Field	Team	Average Fund (1000won)	Institution (Average)		No. of Teams Having One VHS or Company
					Vocational High School	Industry	
Model 1 CECE	Industry	Mold, Engineering, Mechanical design, Mechatronics, Semiconductor, Electronics	10	306,000	2.80	6.00	One VHS: 4 teams One company: 3 teams
		Business	Tourism management, e-Business, contents development, Management information	5	278,000	3.40	12.60
	Others	Cooking, Confectionary & bakery, Child care	3	296,667	2.33	6.33	None
	Subtotal		18	296,667	2.89	7.89	None
Model 2 EaCE	Industry	Construction, Mold, Software, Electronics, Steel Manufacture, Engineering, Computer, IT	15	176,345	3.93	7.07	One VHS: 1 team One company: 2 teams
		Business	Tourism management, Multi-media, Cultural contents, Secretary/office administration, Distribution	7	176,857	3.57	7.57
	Others	Cooking, Confectionary & bakery	4	173,000	2.75	6.25	One VHS: 2 teams
	Subtotal		26	175,967	3.65	7.08	None
Total		44	225,344	3.34	7.41	None	

Since the CEAP begun around May, 2006, it may be too early to assess whether it works or not. However, for the purpose of checking any issues in the process of the

CEAP project, it might be useful to survey the satisfaction and opinion of participants in the CEAP consortiums. According to a survey conducted in October, 2006 (Ahn et al., 2006), the satisfaction of participants in the CEAP consortiums was above the average in all of ten items (M= 3.95) (shown in Table 4). Their higher level of satisfaction with the CEAP means they expected it would work well; however, the satisfaction level of teachers was the lowest.

Among the 10 items, the top four items, that were rated, were the Effectiveness of the Employment Expansion (M=4.30), Effectiveness of the College Education Expansion (4.28), Relevancy of the Goals (M=4.23), and Effectiveness of Securing Top Workers by Industries (4.18). These items reflect the reasons why the CEAP was initiated as an innovative approach to promote vocational education. The bottom four items were the Adequacy of the Ministry’s Regularly Hearings and Offering Guidelines (3.34), Usability of the CEAP Manual (3.61), Adequacy of the Timetable (3.63), and Adequacy of Administrative Support (3.68). These results revealed that the administrative support and policy guidelines from the government should be timely and adequately provided. In addition, it is necessary to provide vocational high schools, which lack experience with government financial support programs, with more active and guidance.

Table 4  
*Management Satisfactions of the Consortium Participants in the CEAP*

Item	Teachers		Professors		Employers & workers		Total	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Industry centered-focus of the CEAP	3.98	0.95	4.10	0.83	4.28	1.13	4.07	0.93
Relevancy of the goals	4.16	0.83	4.27	0.63	4.33	0.77	4.23	0.74
Adequacy of the timetable	3.78	1.01	3.31	1.03	4.22	0.65	3.63	1.01
Fairness in selecting consortiums by the ministry	3.85	0.74	4.16	0.66	4.11	0.83	4.02	0.73
Adequacy of administrative support	3.67	1.07	3.71	1.03	3.72	0.96	3.68	1.02
Usability of the CEAP manual	3.49	0.96	3.65	0.93	3.89	0.83	3.61	0.93
Adequacy of ministry’s regularly hearings and offering guidelines	3.16	0.83	3.50	0.86	3.50	1.04	3.34	0.88
Effectiveness of the employment expansion	4.22	0.85	4.39	0.67	4.28	0.83	4.30	0.77
Effectiveness of the college education expansion	4.20	0.91	4.42	0.61	4.17	0.99	4.28	0.81
Effectiveness of securing top workers by industries	4.10	0.90	4.35	0.72	3.94	0.94	4.18	0.84
Total	3.88	0.69	4.01	0.57	4.04	0.74	3.95	0.65

Note. 1=Strongly dissatisfaction, 2=Dissatisfaction, 3=Moderate, 4=Satisfaction, 5=Strongly satisfaction

Source: Ahn et al. (2006). p.32.

An evaluation on the operation results of the 1st year (2006) of CEAPs was carried

out by a review team appointed by the Ministry of Education and HRD during May of 2007. The results showed that the first annual project was successful even though the period of the project was short, because the project was initiated late. Based on the evaluation results, however, two out of the 44 consortiums were cancelled due to their low performances; thus, 42 consortiums (17 Model 1 programs and 25 Model 2 programs) for the year of 2007 were decided to be funded with a total of 10.2 billion won in 2007. In total, 38 junior colleges, 175 vocational high schools, 429 industries, and 15 provincial offices of education participated among the 42 consortiums.

### **Major Issues and Measures for Better Management**

The CEAP, launched in 2006, has been conducted as a demonstration for three years, so it is too early to judge its effectiveness. However, the following five issues and measures for better management could be drawn from the review.

#### **Strengthening the Curriculum Alignment between Vocational High School and College**

The CEAP was launched in order to resolve the transitional problems from vocational high schools to either employment or college education. More efforts are needed to strengthen the curriculum alignment between a junior college and more than one vocational high school in a CEAP.

In terms of the curriculum alignment, junior colleges have the freedom to set a new curriculum while vocational high schools have a limitation because they must follow the national and local curriculum standards and guidelines. This difference causes a big obstacle for vocational high schools to develop or revise an articulation curriculum with a junior college. As a junior college has a contract with multiple high schools, differences in teachers and on-site equipments in high schools make it difficult to design the industry-oriented curriculum. Therefore, the educational authorities, such as the central government or provincial offices of education, should allow vocational high schools to design their curriculum with more freedom for the purpose of the CEAP project.

Meanwhile, vocational high schools have faced several problems to manage the articulation curriculum and customized courses for those who participate in a CEAP in collaboration of a junior college and several industries. With normal-sized classes, it might be easier for a vocational high school to teach its separated curriculum independently and easier for students taking CEAP to be taught after school in extra activities. This would give extra work to teachers and cause students to hesitate to participate in a CEAP.

In fact, the evaluation results of the first year CEAP project showed that several consortiums offered their curricula in e-learning, special full-day courses, or after-school activities instead of regular courses. In addition, because of the possibility that the related courses are not included in the regular curriculum, students were less motivated to participate, and teachers have a dual burden. As such, they should be

related in the current curriculum, but separate groups must be formed in different classes instead of excessively changing the curriculum for advanced learning. Tools and technologies of the aligned industries could be utilized to conduct education suitable for the site.

Besides, alignment education can be conducted via projects with junior colleges and industries. In addition, high schools can efficiently adjust the course schedule, meaning they could apply "block scheduling" to maximize the effectiveness of the cooperative employment agreement program. Instead of having 50-minute classes of all subjects, the school could have 100- or 150-minute-long classes depending on the features of subjects. In addition, the minority — students participating in the CEAP — could be allowed to conduct specially designed activities that are related to the courses. Furthermore, if the CEAP plays an important role to enhance the quality of vocational education, the results of high school students, completed in a CEAP, should be given with credits that can be used for the college graduation requirement. Thus, it is necessary to adopt a pre-college course system, similar to an advanced placement (AP) system, in a CEAP.

### **Enhancing the Expertise of Teachers and Professors in a CEAP**

The CEAP is not merely alignment among educational institutions. It is designed to set joint educational goals based on the demands of the cooperative industries and to develop and operate the vocational education courses in a collaborative approach. Therefore, teachers participating in the CEAP need to meet the demand for practical changes in school based on the needs and purposes of the CEAP, to develop and implement the curriculum suitable for the background and characteristics of the CEAP, and to maintain organic relationships with industries. At the same time, in-service education programs on the CEAP must be planned and offered to both teachers and professors. Compared to professors of junior colleges, experienced in government financial support programs, in particular, teachers of vocational high schools lack experience and expertise in developing the curriculum and managing the CEAP. Therefore, those teachers participating in CEAP should be encouraged to take a teacher-training program on the CEAP. The Center for Vocational Education Development, attached to College of Agriculture & Life Sciences, Seoul National University, has offered "A Program on the CEAP" a 60-hour long session every summer vacation. This is a nationwide program.

Therefore, local in-service training programs need to be offered in a consortium or several consortiums by the regional or the same field category (see Table 4). These trainings will broaden the level of expertise as well as participation of teachers through their mutual exchanges and their development of management capability of the CEAP.

### **Facilitating the Participation of Industries**

The success or failure of the CEAP depends on the active participation of industries in accordance with the consortium. That is why the CEAP has stressed the roles of industries in a consortium. Although the agreement among industries, schools, and

colleges was consigned, in the past industries did not actively participate in the CEAP.

According to an evaluation on the operation status of the CEAP teams (Na et al., 2006), the results revealed poor participation of industries and local governments in operating the CEAP. It is noted that the major-failure factor of old 2+2 articulation programs was lack of participation of the industries. Without the industries, a smooth transition of students from school to work is not feasible. Meanwhile, the industries in a CEAP can get benefits, such as securing competent workers and solving their business problems from their participation.

Accordingly, junior colleges and vocational high schools should make an effort to find better competitive industries and to maintain the mutual benefit relationship between them. Therefore, vocational high schools and junior colleges must come up with measures to enable their steady and active participation as well as to secure prestigious industries. First of all, in order to form a contract with prestigious industries, several factors should be considered in advance: industries' participation intention in a CEAP, state-of-the-art technologies and equipment of industries, employment plans via the CEAP, and students' preferences with an industry.

To promote active participations of cooperative industries, first of all the CEAP curriculum should be developed based on their needs and demands and should be implemented in a collaborative way with the industries. However, without government support, efforts of vocational high schools and junior colleges trying to approach industries alone will be rejected. Therefore, central government agencies or local governments must provide industries with various incentives or benefits such as tax credits or a wage subsidy.

### **Visioning the CEAP through Developing More Various Career Paths**

In order to provide vocational education, not terminal but continuing education, the CEAP should provide students with various career pathways toward employment after graduation and acquisition of academic degrees. In the U.S., as the demands for vocational education and continuing education arise, "Career Pathways" is introduced. A career pathway is "a coherent, articulated sequence of rigorous academic and career courses, commencing in the ninth grade and leading to an associate degree, an industry-recognized certificate or licensure, or a baccalaureate degree and beyond (Hull, 2004, p.6)." A career pathway concept is, in nature, similar to the CEAP.

In order to cater to the demands for higher education, the CEAP should expand the university-level education beyond the junior college education. Therefore, students, who completed the college level of the CEAP, can study for one or two years at universities to earn a bachelor degree through the vocational education program (Lipton, 2002). Some of the benefits include providing quality-education contents, easily converting into higher vocational education for students, and avoiding redundant education in each vocational education institute. Furthermore, Bragg, Kirby, Puckett, Trinkle & Watkins (1994) maintained that the expansion of education could serve as a turning point to get rid of the image that vocational education is the "terminal" education by connecting education programs among junior colleges and universities. From the year of 2008,

fortunately, Korean junior colleges can provide a baccalaureate degree program, called the major-intense program, for those who have worked for over one year at the industries after graduation of junior colleges.

In Korea, most students with strong, educational aspiration have preferred to enter four-year universities. If those who have completed the curriculum of the CEAP could be transferred to a four-year university, more quality students are likely to participate in a CEAP and apply for transfer to a university. As long as students can obtain bachelor's degrees and are guaranteed with employment in a noted industry through the CEAP, they will be more satisfied with vocational education, and in the future, more students would want to actively participate in the CEAP with their clear visions and self-esteem. In turn, these achievements will change the image of vocational education to upgrade the quality of vocational education and to overcome the limits of both vocational high schools and junior colleges.

### **Strengthening the Network Systems**

The achievements in establishing, planning, developing, operating, and evaluating stages of the CEAP will result from a rational management system. To increase the efficiency of the CEAP, effective networks should be established within a consortium as well as among all of the consortiums with experts. Particularly, national or local networks must be formed to exchange pieces of information, ideas, and best practices for the participants. Fortunately, a National Promotion Council for the Cooperative Employment Agreement Program has been established in August, 2006. This council was composed of all of the consortium leaders. However, the Council should also be networked with the Education Ministry, metropolitan city, and provincial education offices, and national vocational education research institutes. By doing so, the practical information can be exchanged, and a linkage among policies, research, and implantation can be systematically aligned.

## **Conclusion and Recommendation**

Since 2006, the CEAP has been successfully underway in a demonstrative project as it was designed to do. The CEAP was designed as a new innovative approach to improve the career paths or the transitions for graduates of vocational high schools toward either employment or college education. In short, the CEAP aims to operate a customized educational program based on the partnership and cooperation among the participating institutions, to reduce unnecessary overlaps or inefficiency in education by aligning the curricula among secondary and higher education levels, and to produce a competent workforce with high on-site adaptability. So it can be said that the CEAP could be more effective than the old 2+2 articulation program, adopted in 1997.

The CEAP is effectively conducted and managed in a consortium consisting of the representatives from each institution among vocational high schools, junior colleges, industries, and local governments. The effective processes could be divided into

following five processes: establishing the basis, organizing a consortium and plan, developing the program, operating the program, and evaluating the program. In particular, two basic models for the CEAP were provided: Model 1 is the Combining Employment and College Education (CECE); Model 2 is the Employment after College Education (EaCE). For the years of 2006 and 2007, the Model 2 consortiums have been more funded than the Model 1 ones, even though the Model 1 was intended to be funded more than Model 2 in the plan.

In the CEAP, the stakeholders showed that their attitudes toward the CEAP and its expected effects were both positive. However, the five major issues for better management were identified: strengthening the curriculum alignment between vocational high schools and junior colleges, enhancing the expertise of teachers and professors, facilitating the participation of industries, visioning the CEAP through developing more various career paths, and strengthening the network systems. Especially, those measures recommended for better management of the CEAP should be taken at the consortium level as well as at the government level. It may be concluded that the Korean CEAP approaches could be applied as a standard reference and be used by other countries, such as Japan, China and Taiwan.

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## **Foundation of OJT in Japanese Enterprises - For New Vocational Education Training Systems**

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**ABSTRACT** In the background of the problem concerning the initial career of the young person symbolized by an NEET or a job-hopping part-timer, public system of the vocational education/ training which include OJT in its process have been implemented since 2004. Therefore author investigated with the viewpoint of “the infrastructure of OJT” in enterprises in 2006. As a result of analyzing the reply of about 1600 companies collected from 10,000 companies which sent the questionnaire, we made clear that state of structure or human resources to support OJT in a company had a gap according to a company scale, a type of industry and business condition.

**KEY WORDS** OJT (On the Job Training), Enterprises, Vocational Education Training, System, Japan

### **Introduction**

“Japanese version Dual-system” was begun in the background of the problem concerning the initial occupation career of the young persons symbolized by the ‘NEET’ and the “Job-hopping part-time worker” in 2004. This is a system that takes OJT in the enterprise into the process of public vocational education training. There are some structures in this framework. Table 1 shows the present entire frame. At first there is a structure called “an education training institution-led model” carried out from 2004. This is the structure in which schools (senior high schools, vocational schools, vocational training institutions) consigns the workplace training (OJT) of the student to companies. The Japanese version Dual-system has the structure of “the company-led model” other than the above-mentioned education training institution-led model. The company-led model was named formally “Practical type human resources development system” and begun from April, 2007. The structure is that a company recruits trainees, makes a terminable employment agreement, and performs a minimum of six months and up to a maximum of two years of education and training with the combination of OJT in a company and Off-JT in an education training institution. Therefore, this type of vocational training system can be said to be close to the Dual-system of Germany in the

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employment relationship between a trainee and a company. In addition, since the rate of OJT of education training during a period is 20% - 80%, it can compose the setting rate of Off-JT and OJT of this structure flexibly.

Such a new vocational education training system can be understood with the expectation for the educational function in the occupation spot, or a rise of value of including OJT by enterprises in an education training process. The ability of OJT of a company is required by the new structure of vocational training for youth which includes the OJT in the educational process. It's required that the OJT is deliberate. Then, the author investigated the infrastructure of the OJT in enterprises in 2006.

Table 1  
*Present Entire Frame of Vocational Training with OJT*

	Authorized vocational training in industry	Japanese version dual system (Education training institution-led model)	Practical type human resources development system
Institutional starting	Since 1958 (Establishment of the Vocational Training Law)	Since 2004	Since 2007
Background	Succession to apprenticeship training systems by the Apprenticeship Training Act in 1916, 1939 and 1947	Problem in the initial occupation career formation and youth's severe employment situation ( in particular, based on "the youth independence / challenge plan" that assumed an anti-NEET job-hopping part-timer )	"Company initiative type" following the "Education/ training institutions initiative type" preceded by the Japanese version dual system. Planned training as correspondence to extensive retirement of skilled workers.
Object person	Persons who are employed besides in a process of training	Unemployed, non-worker and job-hopping part-time worker of less than 35 years who do not have stable work	Mainly new school graduates ( from 15 to less than 35 years old )
Responsible organization	Business proprietor provide new school graduates with approved vocational training	Education training institutions recruit students and carry out training.	A business proprietor who got approval of the training plan recruits a trainee. Moreover, a business proprietor makes a trainee receive Off-JT in a training institution.
Employment relation	The employment relationship between trainees and enterprise which provide the training is regular	Students are at first on the register in the educational training institutions, and perform the company training by "entrustment" (There is no employment relation).	A business proprietor and a trainee make an employment agreement (it may be a definite period) and a training contract first.

	Authorized vocational training in industry	Japanese version dual system (Education training institution-led model)	Practical type human resources development system
Term/ Training hours	Training hours is laid down by the standard of an enforcement ordinance of the HRD Law. 1400 hours per year ( standard; in case of the long term course )	Type of using private vocational /technical schools: 800 hours per year (standard ) Type of using public vocational training institutions:1400 hours per year (standard ) Type of using entrustment courses financed by public vocational /training institution: 3 months for Off-JT and 1 or 2 months for OJT( in enterprises)	<ul style="list-style-type: none"> <li>• More than 6 months, less than 2 years</li> <li>• The number of total hours is more than 850 hours a year</li> </ul>
Ratio of OJT	“Dispersion training” in the workplace is included in OJT	Between 20 and 60 % of the total training hours	More than 20 %, less than 80 % of the number of training total hours
Burden of training cost	Mostly business proprietors bear the expense ( They can get subsidy for training from government )	Basically trainees bear the expense of Off-JT in the school	A trainee bears the expense of the Off - JT basically.
Handling of the labor laws	Here are some exceptional cases in the Labor Standards Law. (E.g. minimum wages, work restraints for youth, etc.)	None	While carrying out the OJT, labor relation statutes, such as Labor Standard Law, Workers' Compensation Law, Minimum Wage Law, and labor security and hygiene law, are applied.

## Background and Outline of the Investigation

### The General Condition of OJT by Existence Investigations

The meaning of OJT may be seen in broad terms. For example, the system in which a newcomer follows the senior of a workplace, and getting work skills is also included in the category of OJT. These including ad hoc OJT are set to OJT of a broad spectrum. However, the grasp of an accurate situation is difficult in OJT of the wide sense that can be variously interpreted. For example, it is very difficult to sort labor and OJT clearly in comparison with Off - JT when we understand the total time of the education training. Therefore, we have set OJT in the narrow sense, that is, "Premeditated OJT" at the investigation concerning OJT. “Premeditated OJT” means defining concretely the plan of an instruction, person in charge, a candidate, a period, the contents, etc., and carrying out OJT gradually and continuously.

The general condition of the Premeditated OJT brought together based on existing investigations is as follows. The Ministry of Labor has periodically investigated OJT as one of the investigation items concerning the education training in enterprises over a comparatively period of time. According to the regular investigation, the execution rate of the Premeditated OJT in the enterprises has changed as shown in Figure 1.

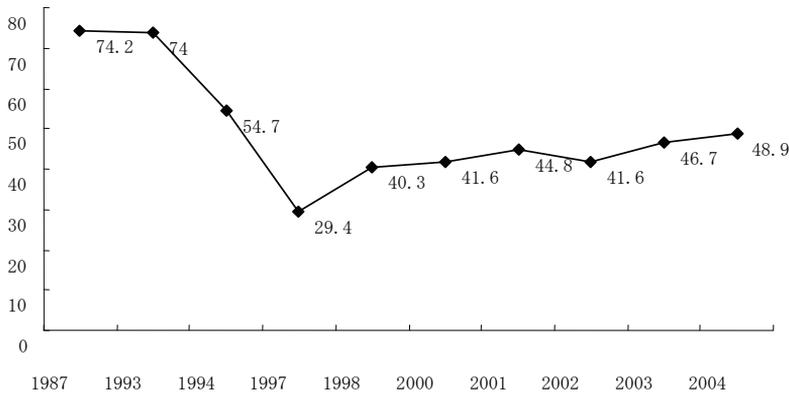


Figure 1. Execution Rate of the Premeditated OJT in the Enterprises

The feature of the transition is that the tendencies of the execution rate differ greatly henceforth 1992 or before. That is, 70% or more of companies in the 80's carried out the Premeditated OJT, but a low rate of execution has continued since 1992 and afterwards. In addition, concerning the ratio of the regular members who received the Premeditated OJT, it falls to about 30% after 2000 from the 50% level in the 90's. The fall is especially notable in the younger age group with less than three years work experience.

All over the country, the decreasing tendency of the enterprises that execute the Premeditated OJT can be confirmed from existing investigations. The execution rate of the Premeditated OJT has the feature that the rate of execution is low, so the smaller the company the less OJT opportunity. The execution rate of the Premeditated OJT compared according to industry is not the same either. Moreover, when the employee is divided into the regular member and the non-regular member, the execution rate of the Premeditated OJT is regular member 48.9% and non-regular member 18.3%. There is a big difference at an attendance opportunity of the Premeditated OJT of both.

**Outline of the Investigation – Object and Answer Situation**

It is in the manufacturing industry that the execution rate of the Premeditated OJT is comparatively high (52.4 % in 2004) when we compared it by industrial distinction. This tendency has not changed for years. Therefore we investigated concerning the

Premeditated OJT for manufacturing that was the main area of vocational training. We sent the questionnaire to 11,200 business establishments in October, 2006, and collected the answer from 1645 places (effective rate of collection 14.7 %). The answers of 1400 business establishments that made manufacturing and maintenance businesses were effective among collected answers, and we targeted them for the analysis (245 establishments not related to manufacturing and maintenance were excluded). The attribute of the business establishments which became the analysis object is as shown in Table 2 (products handled, employee scale, ratio of non-regular member, production form, tendency to advancement).

Table 2  
*Attribute of the Business Establishments for Analysis*

	Item	Percentage
Employee scale	~29	24.1
	30~99	36.5
	100~299	26.5
	300~	11.4
	No answer	1.5
Products handled	Foods	11.1
	Textile	4.6
	Wood/Furniture	2.9
	Oil products	8.0
	Meal/Machine instruments	34.8
	Electric/Machine instruments	16.3
	Others	18.2
	No answer	4.1
Production form	Individual production	32.8
	Lot production	48.4
	Continuous production	16.0
	No answer	2.9
Ratio of non-regular member	~5%	48.7
	6~10%	13.6
	11~15%	8.8
	16~20%	5.8
	21%~	21.4
	No answer	1.7

There were 729 establishments (52%) which executed the Premeditated OJT among 1400 establishments we obtained 655 valid responses (47%) of which did not execute it. This result is almost the same as the result of the investigation in 2004. The execution rate of the Premeditate OJT depended on the type of business establishment, as shown in table 3. In addition, 60% of the establishments which didn't execute the Premeditated OJT still thought it were necessary."

Table 3  
*Execution Rate of the Premeditated OJT*

	Item	Percentage
Employee scale	~29	26.8
	30~99	48.8
	100~299	71.4
	300~	74.8
Products handled	Foods	37.5
	Textile	37.5
	Wood/Furniture	29.3
	Oil products	55.9
	Meal/Machine instruments	54.2
	Electric/Machine instruments	67.7
	Others	51.8
Production form	Individual production	48.4
	Lot production	55.9
	Continuous production	52.9

## Result of the Investigation – The Foundation of OJT

### Organization for OJT

The human organization to support the Premeditated OJT is necessary. For this reason, we investigated about each arrangement situation of personnel training promotion organization and the full-time human resources development staffs. In addition, “personnel training promotion organization” is an organization to perform decision making and carrying out of the promotion policy systematically by setting up the committee and the task force, etc. We got a result like Table 4 about personnel training promotion organization and the full-time human resources development staffs.

Table 4  
*The Human Organization to Support the Premeditated OJT*

Item	Execute the premeditated OJT	Not executed the premeditated OJT
Preparation rate of personnel training promotion organization	71.2%	34.3%
Preparation rate of full-time human resources development staffs	16.8%	6.2%

There is a large difference in arrangement of both personnel training, promotion organization and between establishments which execute the Premeditated OJT and establishments which didn't execute it. The rate of establishment which employs the full-time human resources development staffs is very low as a whole, and also low in the establishments which execute the Premeditated OJT. At least, it may be said that the full-time human resources development staffs isn't the main condition for execution of the Premeditated OJT.

**Leader of OJT**

Who play role of instruction in OJT? Table 5 shows the result concerning the most dominant leader of OJT in the business establishments which execute the Premeditated OJT. It is understood that managers and leaders in the workplace play the role as the most dominant leader of OJT. It is thought that the managerial position has a meaning more important than the degree of skill as a background for the OJT leader. Moreover, because an expert who knows work well and the experienced person has about one to five years experience and is almost at the same level of role as the OJT leader, it is understood that the degree of skill is not a main requirement for an OJT leader.

Table 5  
*Leader of OJT*

Leader of OJT	Percentage
Managers	35.7
Line leaders	60.6
Experienced person has about one to five years experience	14.5
Long experienced person	14.3
Part-time-engagement person after retirement	0.6
Others	1.9

Table 6 shows the result about the degree of instructional skill and the qualification of instruction required to be a leader. There are about one-third of business establishments which require to attend seminars for improving instructional ability or to obtain the qualification of instruction to the persons who have a managerial position, but there are a lot of establishments which don't require them as a whole.

Table 6  
*Degree of Instructional Skill/Qualification of Instruction Required to the Leader*

Skill and qualification required to be a leader		Total	Experienced person in about one-five years	Long experienced person	Line leaders	Managers
Attending seminars for improving	Imposing a duty of seminar attendance	15.7%	18.0%	14.8%	30.5%	35.9%
	Just to know contents of seminars	8.8%	6.9%	18.1%	23.6%	45.8%
	Not requiring for seminar attendance	75.4%	15.8%	13.4%	31.8%	35.9%
Obtaining qualification of instruction	Indispensable in instructional qualification	6.5%	15.1%	22.6%	30.2%	32.1%
	Recommendation of instructional Qualification	17.1%	11.5%	16.5%	28.8%	41.0%
	Not requiring for instructional qualification	76.4%	16.4%	12.7%	31.4%	36.1%

**Method of Instruction**

Table 7 shows the result of being related with the method of instruction in the business establishments which execute the Premeditated OJT. The ratio of the business establishments which have established the method of instruction is a little less than 40%, and the ratio of the establishments which have not established is 60% among the establishments which execute the Premeditated OJT. Concerning why guidance method is not established the reason "the method of instruction is not unified in the company" accounts for 77%.

Table 7  
*Premeditated OJT and Establishment Instruction Method*

Method of instruction	Percentage
Have established instruction method	38.3
Have not established instruction method	59.1

**Tool for Enforcement of OJT**

We assumed that “job standard documents” and “job map” were tools required in order to execute the Premeditated OJT smoothly. Table 8 shows the result of the preparation situation of the two tools. The business establishments executing the Premeditated OJT have a higher ratio to prepare the two tools than the establishments which do not execute it. The preparation rate of the "job standard documents" is high as a whole. In particular, it's a big feature that 90% of the business establishments, which execute the Premeditated OJT, prepare them. The preparation rate of the job map is low compared with the job standard documents, and the ratio has stayed half even in business establishments which execute the Premeditated OJT. The job map is not an indispensable tool although the job standard documents can be called an indispensable tool for smart OJT.

Table 8  
*Preparation of Tools for the Premeditated OJT*

Preparation of tools	Executing the Premeditated OJT	Not executing the Premeditated OJT
Preparation rate of job standard documents	89.8%	62.1%
Preparation rate of job map	54.2%	18.2%

**Conclusion**

As the structure of new vocational education training is an important opportunity in connection with young persons’ initial occupation career to take OJT in the company into public education training process, it is desirable to perform OJT premeditatedly. However, the ratio of the business establishments which execute the Premeditated OJT is almost half as shown by this investigation. Especially, the execution rate of the

Premeditated OJT in small-scale establishments of 100 employees or less has fallen below the average. Although the small-scale business establishments which excel in number are in main position in which to sponsor the opportunity of OJT, it can be pointed out that their ability to execute OJT in premeditation tends to be insufficient. Moreover, they tend to not require their leaders to have instructional skills nor qualification of instruction, on the whole. Particularly, the company is smaller, the tendency is stronger. 60 percent of the business establishments that execute the Premeditated OJT have not established the method of instruction. Furthermore, it's not difficult to guess the condition of the business establishments which don't execute the Premeditated OJT. The job standard documents and the job map are considered to be tools for executing OJT smoothly. Although the job standard documents are prepared comparatively well, the job map is not a well preparation.

It is difficult to say that the situation about the foundation of OJT in business establishments is not enough, as shown above. For business establishments of the small-to-medium-sized scale, the offer of OJT for a new vocational education training system is a good opportunity to reconstruct their own OJT. In addition, public support will be necessary for companies raising the power of human resources development centered on OJT.

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## **Safety-hygienic Cognitions and Attitudes of Taiwanese College Students**

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**ABSTRACT** This study investigated safety-hygienic cognitions and attitudes of Taiwanese college students. A questionnaire was developed by researchers to investigate subject students' safety-hygienic cognitions and attitudes. Based on the survey, both safety-hygienic cognitions and attitudes of college students are positive. Safety-hygienic cognitions of students on different school locations and with different learning experiences revealed significant differences. Also safety-hygienic attitudes of students in different grades, on different school locations and with different learning experiences demonstrated significant differences. Finally, a significant correlation was found between safety-hygienic cognitions and attitudes.

**KEY WORDS** Safety-hygienic Cognitions, Safety-hygienic Attitudes, Higher Education, College Students

### **Background**

The Council of Labor Affairs in Taiwan has actively promoted labors' safety hygiene since 1984. The occupational calamity rate per thousand labors was thus reduced from 5.91 in 1987 to 4.44 in 2005 (Council of Labor Affairs, 2006). However, The Taiwanese occupational calamity has been higher than those of developed countries. In 2001, the death rate in occupational calamity of Taiwan was .069 while Britain .008, Germany .030, Japan .024, and the United States .040 (Council of Labor Affairs, 2006). Therefore, it is important to let labors know about safety hygiene, and to change their attitudes. It is believed that having proper knowledge and attitudes may contribute to decreasing occupational calamity.

Students in departments of engineering or technology are required to have lab/workshop credits. Although workshops in colleges are recognized as valuable learning places, the calamity caused from safety-hygienic deficit occurs frequently. Students in workshops usually operate many kinds of equipments, and come in contact with damaging materials and wastes. There are many kinds of potential hazards in laboratories or at workshops such as chemical, physical, biological, ergonomic and psycho-social hazards.

It is believed that safety-hygienic cognitions benefit finding out the causes of

laboratory calamity and recognizing dangerous materials and unsafe operation on equipments. They also contribute to developing attitudes on safety-hygiene. And, safety-hygienic attitudes will lead safety-hygienic behaviors (Tsia, 1997; Zheng, Lee, Hsiao & Wei, 2005). Both safety-hygienic cognitions and attitudes may thus protect students from calamities in laboratories or at workshops.

In recent years, only a few researchers surveyed students' safety-hygienic cognitions and attitudes. However, they did not reach a constant conclusion (Kuo, 2005; Liu, 2005; Zao, 1993). This study therefore tried to further investigate college students' safety-hygienic cognitions and attitudes. The results may contribute to improve students' safety-hygienic cognitions and attitudes and thus reduce calamities in laboratories or at workshops.

### Objectives

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.

### Research Design

#### Subjects

The population of this study was defined as students in departments of engineering or technology at public universities in Taiwan. Samples were randomly selected from two universities in northern Taiwan area, one in middle, and two in southern. Two departments of engineering or technology were randomly selected from each of the sample universities. Forty subject students were randomly selected from each of the 10 sample departments. Totally, this study has 400 subject students.

Table 1  
*Numbers of the Subjects, Respondents, and Valid Questionnaires*

Item	Male		Female		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Subjects	153	38.3	247	61.8	400	100.1
Respondents	128	32.0	233	58.3	361	90.3
Valid	124	31.0	225	56.3	349	87.2

Among the 400 subject students, 361 (90.3%) responded to the investigation. However, only 349 (87.2%) questionnaires are valid after excluding the uncompleted

ones. Among the valid questionnaires, 124 (31.0%) were from male subject students and 225 (56.3%) female subject students. Table 1 summarizes the statistics in detail.

**Instrument**

For investigating students’ safety-hygienic cognitions and attitudes, a questionnaire was developed by the researchers. Items of the questionnaire were derived from the “Scale of Hazard Risk Perceptions in Laboratories” and the “Scale of Staffs Safety Attitudes” (Lee & Yeh, 1995; Liu, 2005). The first part of the questionnaire has 37 items for measuring safety-hygienic cognitions. Cronbach  $\alpha$  coefficient of the part is .86. The second part includes 41 items for measuring safety-hygienic attitudes. Cronbach  $\alpha$  coefficient of the part is .97. Both the two parts use the Likert’s 5-point scale for scoring. The third part comprises 4 items to investigate such independent variables as gender, grade, school location, and learning experiences.

**Data Analyses**

Descriptive statistics such as mean score and standard deviation were employed to explore the distribution of subject students’ responses. Also, a t-test was used to examine the differences between the mean scores of male and female respondents, city-university and country-university respondents, and respondents having and not having safety-hygiene courses. Analyses of variance (ANOVA) were used to examine the differences among the mean scores of different grade respondents. Finally, analysis of product-moment correlation was employed to explore the relationship between safety-hygienic cognitions and attitudes

**Findings**

**Cognitions and Attitudes of Male and Female Students**

Both male and female respondents indicated a high degree on safety-hygienic cognitions (M = 3.98, SD = .36; M = 3.99, SD = .40). Comparatively, both male and female respondents revealed a lower degree on safety-hygienic attitudes (M = 3.44, SD = .41; M = 3.52, SD = .50). No significant difference was found between male and female respondents. Table 2 demonstrates mean scores, standard deviations, and results of t-test in detail.

Table 2  
*Mean, Standard Deviation and t-test of Safety-hygienic Cognitions & Attitudes by Gender*

Item	Gender	Mean	SD	t
Safety-hygienic cognitions	Female	3.99	0.40	-0.29
	Male	3.98	0.36	
	Total	3.98	0.38	
Safety-hygienic attitudes	Female	3.52	0.50	-1.70
	Male	3.44	0.41	
	Total	3.49	0.47	

**Cognitions and Attitudes of Students at Different Grades**

Mean scores of safety-hygienic cognitions described by respondents at different grade range from 3.87 to 4.03. They are all around the high level. To examine their mean scores, sophomore respondents have the comparatively high score (M = 4.03, SD = .40). The mean score of junior respondents is the lower score (M = 3.87, SD = .35). However, there is no significant difference between each two of the four grades.

In terms of safety-hygienic attitudes, mean scores of respondents at different grade range from 3.36 to 3.80. They are comparatively lower than those of safety-hygienic cognitions. Senior respondents have the higher score (M = 3.80, SD = .47). The mean score of junior respondents is again the lower score (M = 3.36, SD = .31). According to analyses of variance (ANOVA), the mean score of senior respondents is significantly higher than those of freshman and junior respondents (F = 4.6, p < .01). Table 3 describes the statistical results in detail.

Table 3  
*Mean, Standard Deviation, and ANOVA of Safety-hygienic Cognitions & Attitudes by Grade*

Item	Grade	Mean	SD	F	Scheffé			
					①	②	③	④
Safety-hygienic cognitions	Freshman	3.99	0.39	2.1				
	Sophomore	4.03	0.40					
	Junior	3.87	0.35					
	Senior	3.94	0.33					
Safety-hygienic attitudes	Freshman	3.48	0.50	4.6**			*	
	Sophomore	3.52	0.47					
	Junior	3.36	0.31				*	
	Senior	3.80	0.47					

\*\* p < .01

**Cognitions and Attitudes of Students on Different School Locations**

With regards to school location, city and countryside respondents also revealed a high degree on safety-hygienic cognitions (M = 4.04, SD = .42; M = 3.94, SD = .35). However, they both indicated a lower degree on safety-hygienic attitudes (M = 3.63, SD = .52; M = 3.94, SD = .41).

Table 4  
*Mean, Standard Deviation, and t-test of Safety-hygienic Cognitions & Attitudes by School Location*

Item	School location	Mean	SD	t
Safety-hygienic cognitions	City	4.04	0.42	2.49**
	Countryside	3.94	0.35	
Safety-hygienic attitudes	City	3.63	0.52	4.42**
	Countryside	3.94	0.41	

\*\* p < .01

Meanwhile, significant differences were found between city and countryside respondents on safety-hygienic cognitions and attitudes ( $t = 2.49, p < .01$ ;  $t = 4.42, p < .01$ ). Table 4 summarizes statistical results in detail.

**Cognitions and Attitudes of Students with Different Learning Experiences**

No matter having safety-hygienic courses or not, respondents showed a high degree on safety-hygienic cognitions ( $M = 3.99, SD = .44$ ;  $M = 3.97, SD = .33$ ). Nevertheless, they all indicated a lower degree on safety-hygienic attitudes ( $M = 3.54, SD = .51$ ;  $M = 3.45, SD = .42$ ). Based on t-test, there are significant differences between respondents of having and not having safety-hygienic courses on both safety-hygienic cognitions and attitudes ( $t = -.29, p < .01$ ;  $t = -1.70, p < .05$ ). Table 5 shows mean scores, standard deviations, and results of t-test in detail.

Table 5  
*Mean, Standard Deviation, and t-test of Safety-hygienic Cognitions & Attitudes by Learning Experiences*

Item	Learning experiences	Mean	SD	t
Safety-hygienic cognitions	Have courses	3.99	0.44	-0.29**
	Not have courses	3.97	0.33	
Safety-hygienic attitudes	Have courses	3.54	0.51	-1.70*
	Not have courses	3.45	0.42	

\*  $p < .05$ , \*\*  $p < .01$

**Correlation between Cognitions and Attitudes**

According to an analysis of product-moment correlation, a significantly positive correlation between safety-hygienic cognitions and attitudes was verified. The correlation coefficient is .30, and up to .01 level of significance.

**Conclusions**

In general, attitudes of Taiwanese college students are positive and they reach a high degree on the safety-hygienic cognitions. Male and female college students had the same level of safety-hygienic cognitions. So did freshmen, sophomores, juniors, and seniors. However, college students in city area revealed a higher degree of safety-hygienic cognitions than those in countryside. College students having safety-hygienic courses also showed a higher degree of safety-hygienic cognitions than the others.

In terms of safety-hygienic attitudes, no significant difference was found between male and female college students. But, seniors demonstrated more positive on safety-hygienic attitudes than juniors and freshmen. Safety-hygienic attitudes of college students in city area revealed more positive than those in countryside. Also, safety-hygienic attitudes of college students having safety-hygienic courses showed more

positive than the others. Finally, a significant positive correlation was verified between safety-hygienic cognitions and attitudes at the college level.

## Recommendations

Since safety-hygienic cognitions significantly correlate with attitudes, the proposition that enhancing cognitions for developing attitudes may be verified to some extent. Secondly, safety-hygienic cognitions and attitudes of college students having safety-hygienic courses revealed more positive results than the others. Safety-hygienic education is therefore worthy and needs to be enhanced continuously. Safety-hygienic education in colleges in the countryside needs to be seriously reinforced because this study indicates that students from that population have comparatively poor safety-hygienic cognitions and attitudes. It is expected that safety-hygienic education will contribute to developing attitudes on safety-hygiene, and then lead safety-hygienic behaviors. Calamities may thus decrease and even vanish from school workshops.

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