KRIVET

2008 KRIVET Research Abstracts

KRIVET Korea Research Institute for Vocational Education & Training

Foreword

The Korea Research Institute for Vocational Education and Training(KRIVET) was established in 1997 to carry out researches on technical and vocational education, training, and Human Resources Development(HRD). It has also been supporting government policies for the purpose of developing the vocational capacity through Technical and Vocational Education and Training(TVET) as part of lifelong learning.

Since 1998, KRIVET has annually published compilation of abstracts from the research reports of each year to share with other related institutions, policy makers, educators and students throughout the international community.

The abstracts in this volume are from 42 research reports among more than 150 researches conducted in 2008 by KRIVET researchers. This year's edition includes researches on renovation of Human Resource(HR) policies, enhancing industrial competitiveness, influence of Free Trade Agreement(FTA) in labor market, Vocational Education and Training(VET) international comparison, Behaviorally Anchored Rating Scale(BARS), and more.

As many parts of the world are faced with and suffering from the international economic crisis, it is hoped that this "2008 KRIVET Research Abstracts" will serve as an informative guide for the readers around the world, hence contribute to the common prosperity.

Prof. Dr. Dae-Bong Kwon
President, KRIVET

Contents

1. Young Adult Generation Unemployment Research

Chang-Kyun Chae, Ho-Young Oh, Jae-Ho Jeong,
Gi-Heon Kim, Gi-Gon Nam

This research is constructed of 7 parts. Both purpose and main results of this research are as follows:

First, in this research, unemployment and idleness of young adult generation were prescribed as NEET(Not in Employment, Education, or Training), and how we could assign that concept was examined. For grasping the whole scale and time-series of NEET, we should use the Economic Activity Population Survey of National Statistical Office. In terms of practical use of Economic Activity Population Survey, this research provided the concept of NEET more usefully. Moreover, through the critical investigation about the preexistence discussion, the research redefined what NEET was, and based on this point of view, examined NEET young adult generation's scale and time-series.

Second, this research analyzed a factor which effected the time-series of NEET young adult generation. In the concrete, this research looks into how labor supply fluctuation, such as change in labor demand, or increase of women employment affected the scale of NEET. Then this study examines whether transition between employment and unemployment, frequently found in the young adult generation, affects the scale of NEET. For this examination, we applied ECM(Error-Correction model).

Third, we analyzed the main specialty of NEET. Analyzing the reasons for the young adults becoming NEET was the most important concern. From this result, we could avoid the occurrence of NEET. Obstructing the cause of NEET was the best way to solve the problem. For this analysis, KLIPS data of Korean Labor Institute was used.

Fourth, by utilizing the Life Time Use Survey data of National Statistical Office, research was conducted on the actual condition of how NEET uses their time. Also, differences in time usage among NEET, young adult employee, and unemployed young adult were clarified. Main analysis methods used in this section were quantity analysis of time usage and Correspondence Analysis.

Fifth, we explored the sustainable possibility of NEET. Namely, we found the rate of long-term continuance of NEET condition, and re-entry possibility between the people who underwent the NEET situation one time and the people who were NEET for long period of time. In addition, we examined labor market performance between the people with no experience of NEET and the people who had at least once been NEET. For this section, we used Economic Activity Population Survey of National Statistical Office and KLIPS of Korea Labor Institute.

2. Facilitation of Work-to-School Transitions of Adult Workers(II): Focused on Higher Educational Institutes

Ji-Sun Chung, Jong-Woo Kim, Joo-Sub Kim

1. Research Outline

This two-year study is conducted with the purpose of analyzing the current situation of work-to-school transition and suggesting facilitation measures focused on higher education. Some methodologies are employed to draw the problems and facilitating measures of work-to-school: review and analysis of related literatures, statistical data, analysis of foreign successful cases, specialist conferences, and a debate. While the first-year study surveyed higher education institutes and industries to reveal the work-to-school situation of employees, the second-year study surveyed 2,018 employees to analyze their demands and the needs for education and training in the higher education.

2. Importance of Skill Development of Adult Workers

Lifelong learning is to increase the employability and the adaptability of adult workers, directing toward the economic development ultimately. According to the Human Capital Theory schooling results in increment of productivity at the national level and upturn of wage at the individual level. Continuing education and training have become an imperative to an individual with the advent of lifelong learning society posed by the globalization, changes in the science and technology, structural changes of the labor markets, and aging of the society. In spite of the growing importance of lifelong learning, especially in higher education, the system is not fully ready to provide individuals with opportunities to return to school. Participation in lifelong learning of adults is below average compared to other OECD member countries, and is even far lower in job skill

development program. However, the rate of desire for participating in learning programs of higher education institutes is found out to be high.

3. Case Studies of Foreign Countries

In England and America, the remarkable characteristics of work-to-school system of colleges can be abstracted as follows. First, the autonomy of curriculum development, admission system, and opening and management of programs are ensured. Also, on one hand, the work-to-school systems of colleges focus on the demands of the industries. On the other hand, the needs of workers for learning are supported with tuition fees and scholarships.

In Northern European countries the job related skill development of workers is actively supported by the government. Especially colleges and universities provide work-to-school programs to workers smoothly based on the law and institutes. Japan has a similar education system and labor market structure to Korea, and now speeds up the development of lifelong learning system. Japanese government leads colleges system of work-to-school and lifelong learning programs utilizing employment insurance system. Answering especially to the educating society, the work-to-school system of the graduate schools is under construction.

4. Survey Results of Employees for Work-to-School

The preference of employees for lifelong learning institute remarks that the higher education institutes - graduate schools, universities, 2-year colleges - are preferred than other training centers or industry training centers. Even though they are not very much satisfied with the learning experiences in the colleges and universities with the lack of field-oriented practical learning, the degrees awarded and the human and material resources for learning are highly evaluated. The expectation for the college education is rather high. Also, they demand various kinds of programs such as the qualification courses and short-term training programs to be created in the colleges.

5. Facilitating Measures for Work-to-School of Higher Educational Institutes

The work-to-school programs should be developed responding to the knowledge based society and the demands of the labor market by the higher education institutes, with the consideration of promising industries and jobs. Industry-academia cooperation can strengthen the effect of job skill development education and training. The exchange of industrial personnel and college professors facilitate cooperation of both sides. The programs provided by colleges should be reformed as adult learner-friendly, which means that the entrance system, class operation, recognition of prior learning experience, and credit/degree systems should be open to adult learners eradicating the barriers of the time and money for the education. Not only the problem solving based learning or action learning, but also the benefit of the blended learning needs to be maximized.

The government has to exercise supporting policies for construction of work-to-school system of higher education institutes to embrace the industrial workers. Most of the job skill development program center should be established by the central government to develop substantiality of education and training programs. Public relations of work-to-school continuing education and training need to be strengthened. The financial support to college lifelong learning should be enlarged dramatically. In addition, the infrastructure of lifelong learning of employees in higher education such as legal and institutional basis should be structured and confirmed. Especially, a paid learning leave system should be reinforced for the employees to plan and pursue the life career plan.

Industries are another major institutions for work-to-school transition of workers. The employees cannot participate efficiently in education or training without supports from employers. Industries also try to establish smooth work-to-school transition, recognizing that the education and training of the workers return the profit to the company in the long run. The small and medium sized companies are a major portion of Korean industries. It is not easy for workers of small and medium sized companies to participate in college education to develop their own skills and knowledge. Therefore, the companies should create and expand a culture of emphasizing education welfare of the employees. Also, the employers need to understand that education and training is one of the major tasks of their companies. The result of the education and training of workers should be recognized and reflected to the promotion and financial reward. Job rotation system can propel to expand the learning opportunities for workers.

3. Work Values and Vocational Ethics of Korean(2008)

- Work Values and Vocational Ethics of Employers and Workers in Korean Firms -

Young-Hyun Lee, Mee-Souk Kim, Yoon-Kyung Jeoung,
Min-Soo Kim, Yu-Hyung Shin

The Korea Research Institute for Vocational Education and Training carries out surveys on work values and work ethics of Koreans periodically. 2008 surveys were conducted for employers and workers of firms and professional groups.

The objective of the study is to measure work ethics of workers and business ethics of Korean companies. A survey of 247 managers and 6,053 workers from 263 companies was conducted from June 9 to August 22, 2008.

The survey items included work values, work ethics, job satisfaction, organizational commitment, organizational citizenship behaviors, person-job fitness, job performance, ethical climate and corporate's social responsibility.

Results of the survey are as follows;

First, in order to examine the change of work values of Korean workers, common(comparable) items on work value from 1998 and 2002 surveys were included in the questionnaire of 2008 survey. The result shows that while work values of Korean workers had been increasing, leisure values had been decreasing in the last ten years(1998~2008).

Second, the levels of work ethics of employers and workers were examined. Employers and workers evaluated work ethnics of their groups on a scale of 5. Results present that the level of work ethics among employer group was 3.83 point while the level of work ethics of employees scored 3.59 point.

Third, the influence of work ethics of workers on corporate competence such as person-job fitness, organizational citizenship behaviors, organizational commitment, job satisfaction and job performance was examined. Survey

result shows that work ethics of workers has close relationships with corporate competence.

Forth, the influence of ethical leadership of employers on perceptions of workers on corporate's social responsibility was examined. The result demonstrates that the ethical leadership of employers influences the legal responsibility and the ethical responsibility of corporate's social responsibility.

Fifth, the relationship between ethical work climate and corporate performance was examined. The result shows that law- and ethic-centered work climate and community centered climate forecast the current term net profit of a firm significantly. The community-centered work climate has a positive influence on the job performance, job satisfaction and organizational commitment.

4. Work Values and Vocational Ethics of Korean(2008)

- Work Ethics and Professionalism of Professionals -

Young-Hyun Lee, Sang-Geun Han,
Jae-Ho Chung, Ki-Hun Kim

The Korea Research Institute for Vocational Education and Training carries out surveys on work values and work ethics of Koreans periodically. 2008 surveys were conducted for employers and workers of firms and professional groups.

The objective of the study is to examine work ethics and professionalism of professional groups including lawyer, medical doctor, professor, and reporter. A survey of 800 professionals(200 professionals from each group) was conducted from June 9 to July 31, 2008.

The professionalism was measured in five dimensions drawn from Hall's framework. The five dimensions include the Use of the Professional Organization as a Major Reference, Belief in Public Service, Belief in Self-regulation, Sense of the Field, and Autonomy.

The levels of professionalism on five scales were as follows.

First, level of the Use of the Professional Organization as a Major Reference was the highest among medical doctor(3.90 point), followed by professor(3.78 point), lawyer(3.27 point), and reporter(2.88 point).

Second, the level of Belief in Public Service was the highest among medical doctor(3.70 point), followed by professor(3.24 point), lawyer(3.14 point), and reporter(3.11 point).

Third, the level of Belief in Self-regulation was the highest among medical doctor(3.36 point), followed by professor(3.19 point), lawyer(3.10 point), and reporter(3.02 point).

Fourth, the level of Sense of the Field was the highest among medical doctor(3.90 point), followed by professor(3.86 point), lawyer(3.70 point), and reporter(3.57 point).

Fifth, the level of Autonomy was the highest among medical doctor(3.69

point), followed by professor(3.61 point), lawyer(3.56 point), and reporter(3.03 point).

In addition, the levels of work ethics of professionals were examined. The level of work ethics was the highest among lawyer(3.46 point), followed by medical doctor(3.33 point), professor(3.19 point), and reporter(2.92 point).

5. Social Capital and Human Resources Development(Ⅲ)

- Focused on Inter-firm Relations -

Ahn-Kook Kim, Young-Hyun Lee, Hyeong-Je Cho,
Jang-Pyo Hong, Dong-Won Son, Joo-Il Kim

Korea has confronted a crisis in development and cohesion recently after fifty years of conspicious economic development. At this time, Korea should not only try to make the nation grow persistently by creating the knowledge and innovations, but also to get nation cohesive by people's participation and cooperation. In order to grow persistently and to get people together, the social relations of people is so important that our study focuses on the breeding the social capital which is the corner stone for forming the social relations.

KRIVET(Korea Research Institute for Vocational Education and Training) has been studying the social capital with HRD after 2006. Our study set up the concept of social capital, developed the measuring tool for social capital, and analysed Korea's social capital by regions, sex, and school years in 2006. After 2007, we focused on the capital of business firms in Korea. We measured the levels of intra-firm social capital, and analysed the relation between the level of intra-firm social capital and firm's outcomes, to find their positive correlations. For the last year's study, we dealt with the inter-firm social capital in the automobile, ship, electronic, and software industries in 2008.

We divided the types of inter-firm relationships by the reliance into main firm and the ratio of sale on commission. There are four types: the first type has the high reliance and high ratio of sale on commission, the second type has the low reliance and high ratio of sale on commission, the third type has the high reliance and low rate of sale on commission, and the last type has the low reliance and low rate of sale on commission. Among these types, the last type has the highest level of social capital between firms. The last type is composed of subcontractor firms with high technology.

The social capital affects the technological cooperation between firms. The social capital does not affect the sales of the firms, but affects significantly the

revenue of the firms positively. This result means that firms' sales can grow without social capital between firms, but the firms' revenues cannot grow without social capital between firms.

The policy agenda is clear. In Korea, there are usually vertical relations between firms. Korea should try to enlarge the horizontal and market relations between firms. The horizontal relations and market relations between firms can heighten the level of social capital between firms, and can induce inter-firm cooperations. In order to achieve the high inter-firm trust, firms in advantage should not be interested in exploiting the subcontractor firms. Then firms within relations will enjoy the mutual benefits in mid and long term relations. The government has to try to switch the vertical relations into horizontal relations between firms, and should make efforts to raise the level of social capital between firms by providing incentives and aiding institutional arrangement.

6. Foundational Study for the Renovation of Human Resource Policies: Focusing on Constructing the Infrastructure for Core HRD

Kyeong-Jong Kang, Nam-Chul Lee, Jae-Sik Jun,
Yeo-In Yoon, Whan-Sik Kim

1. Research Summary

Purposes of this study were to develop policies of higher education, scientific and technical human resources, human resources in the knowledge service area, global human resources necessary for the construction of the infrastructure, to improve the quality of the core human resources, and to extract agendas for the policies. Literature review, expert panel, and seminar were introduced for this study.

2. Environmental Changes and the Vision of Human Resource Policies

Important environmental changes, which are deeply related to the human resource policies in the Republic of Korea, are low birth rate and aging society. Due to these environmental changes, Korea has faced many difficulties in the production line of manpower, the consumption and the investment, the rate of economic growth, social conflicts, the productivities of enterprises, the financial assets, and the social security system. Another important change has occurred in the industrial structure. The industrial structure has become that of the knowledge intensive industry, and the ratio of the service industry is expected to be higher consistently. According to the environmental changes, the major governmental human resource agendas in the new regime are to develop core human resources and to construct the infrastructure necessary for the lifelong learning.

3. A Higher Education Policy

The higher education in Korea has rapidly grown quantitatively, but some concerns have been raised in a qualitative respect. It is contended that university education does not correspond with social needs, employers are not satisfied with the abilities of new employees, educational expenditure per student by the government in higher education is not sufficient, universities in Korea lack competency, and so on. Under such circumstances, several plans have been promoted, including liberalizing university authorities, developing socially necessary curriculum, lightening private burdens of tuition fees, and internationalizing the higher education. Based on the reform trends of higher education in foreign countries, a higher education policy for core HRD is proposed. Diversifying the learning paths and the types of higher educations institutes, introducing an achievement test for higher education graduate, and providing career development services are all necessary for developing core human resources.

4. A Scientific and Technical Human Resources Policy

Human resources in science and technology possess associate or higher degrees and work as professionals, technicians and associate professionals, and they are legislators, senior officials and managers(OECD, 1995). To overcome the problems in a scientific and technical HRD such as low competitiveness in science and technology education, insufficient infrastructure, low competitiveness in basic technology, mismatch between curricula and industrial needs, low investment in R&D area, and so on, the following agendas are proposed: 1) 1-to-1 system, which connects university and industry, should be established; 2) science and technology HRD system should be constructed; 3) investment in the R&D area should be increased and made efficient; 4) the infrastructure required for supporting science and technology HRD should be fully constructed; and 5) high brains in foreign countries should be exchanged and utilized.

5. A Knowledge Service Human Resources Policy

The knowledge service industry is defined as a service industry producing a highly value added with intensive utilization of human knowledge. One

characteristic of knowledge service industry is that the industrial growth rate is much higher than those of the others. However, various difficulties in the knowledge service industry have been explored. The productivity of the service industry lags behind other industries, the infrastructure and the systems in the service industry are not fully constructed, the HRD policies for revitalizing the knowledge service industry are not insufficient, governmental projects for the knowledge service industry are overlapped, and the number of professionals in the knowledge service industry is lacking. To overcome the difficulties mentioned above, the general directions of the HRD in the knowledge service need to support the core knowledge service area through the selection and the concentration strategy, strengthening the competitiveness of the financial and the distribution industry through the enlargement and the professionalization strategy, and reinforcing competencies of human resources for the global HRD. The followings are more specific agendas proposed: 1) professionals in the financial industry should be developed in professional graduate schools of the finance and central banks; 2) professionals with global competitiveness, practical skills, and innovation competencies should be developed; 3) the competitiveness of the universities should be raised; 4) a cooperative committee for the HRD should be set up for efficient administering of human resources in the knowledge service industry; and 5) the network between the industry and the educational institutes should be developed

6. A Global HRD Policy

Korea could be transformed from a brain-draining country to a brain-gaining country eventually through securing core human resources in a global setting. The current status of the global HRD policy was presented in the aspects of the basic policy of foreigners, the attraction policy of foreign students, the attraction policy of foreign technicians and scholars, the residence supporting policy, and so on. The case of Australia was reviewed as a representative policy for securing global human resources. The objectives of global HRD policy for core HRD are to create a system for developing global competencies from the elementary and the secondary education and a system of attracting foreign core human resources. More specific agendas are proposed such as reforming the elementary and the secondary education curricula, including industry-based and global competency-related contents in the curricula of professional graduate

schools, combining several policies of education, science and technology, and others.

7. Agendas for the Construction of the Infrastructure

The infrastructure for core HRD in Korea is not sufficient. Related laws and ordinances should be maintained consistently regardless of the government offices, and sufficient statistics and information system should be developed. The Korean Qualification Framework(KQF) should be expanded to advance the qualification and the career development system, and the knowledge policies should be reviewed for the knowledge management. Representative models of the infrastructure were studied through Australian and EU case studies.

8. Agendas for the Core HRD

The goals of the core HRD policies were presented in three aspects: 1) human resource development, 2) human resource utilization, and 3) human resource management. The required infrastructure was proposed in four aspects: 1) laws and regulations, 2) informations and statistics, 3) qualifications and career development, and 4) knowledge management. In total, 16 agendas were proposed for the core HRD.

7. Innovation of Lifelong Skills Development System(Ⅰ): Linkage of Skills Development Strategy with Employment Policy

Young-Sun Ra, Geun Lee, Mee-Sook Kim,
Jae-Sik Jun, Jae-Ho Jung

1. Overview

This study deals with the innovation of lifelong skills development system that focuses on linkage issues of skills development strategy with employment-related policy for improving potential & current workers' employability.

First, we analyzed current skills development system in context of employment policy and labor market policy paradigm shift internationally. Second, we examined the status and issues of skills development system by Transitional Labor Markets Theory(TLM), a new European Employment Strategy initiated by Schmid. For concrete data on transitional labor market, we conducted two kinds of questionnaire surveys(participants in PES & training program). Finally, we re-designed public employment service for linkage of skills development system with employment policy.

2. Main Results

Participation in the labor market is fundamental for social integration. Unemployment is one of the main channels of social exclusions because it prevents people from exchanging their labor services and their productive knowledge. TLM are intended to secure the working and earning capacity of everybody on the labor market. According to TLM framework, we modeled 4 types of transitions(except fifth transition type between employment and retirement) and suggested the policy implications of connection between skills

development strategy and employment policy.

We identified four-types of transitions and investigated policy implications for improving one-side transition to employment: (1) for promoting transition to regular employment among non-regular workers, benefits of employment insurance and opportunities for skills upgrading should be provided. (2) for promoting transition to employment among the employed, placement service, wage subsidies, vocational training, and temporary employment, etc. should be combined and customized to job seekers. (3) for promoting transition from education to employment, career guidance, short training program, internship and job experiences should be provided timely. (4) for supporting transition from non-economical status, private work, and parental leave to economically participating status, various targeting training programs should be developed and accessibility to job searching and training program should be improved.

3. Policy Suggestions

First, new transitional labor market policy should be developed necessary for unemployment reduction. It is well-known that the skills development in particular, is the best practice to improve the employability of the disadvantaged class. Second, transitional labor market policy focusing on skills development is more effective for improving functionality of labor market. For example, the change of service delivery system to incentive system promoting private sector participation in ALMPs delivery, and promoting consortium among various organizations will contribute to a better functionality of labor market. Third, policies improving employability of workers through skills development and securing choice rights in terms of individual life cycle should be implemented for promoting participation in labor market.

Service delivery systems and organizations could be redesigned to an ‘assumed new TLM center’. This study suggests as follows. First, employment service and training delivery systems focus on individual initiative. TLM center will provide information to anyone who wants to work through consulting with job-matching adviser(like case worker). If job-matching adviser recognizes necessity for training, he or she will take a training voucher and unemployment benefit and job seeking allowance are needed for living cost support. We proposed for a ‘Job-matching Voucher’ and ‘Skills Development Accounts’ in order to provide individually customized service. Second, substantial active labor

market policy should be designed for being combined with unemployment benefit and skills development programs. It can be considered as differential unemployment benefit according to the level of participation in active labor market policy. Finally, life-saving earning while participating labor market programs should be secured among weaker people.

8. Exploring a Model for Integrating Career Education with Other Subjects

Eon Lim, Yun-Kyung Jung, Dong-On Choi, Na-Ra Kim,
Myung-Hee Jang, Yun-Soon Jung, Suk-Min Jang

1. Purpose and methods of study

The purpose of this study was to explore the way to integrate career education into academic subjects in schools. Despite large number of agreements on the importance of career education, it has been provided sporadically without systematic coherence. By integrating career education with other subjects, it can be implemented continuously covering wider span of career development competencies. Through this integrative approach, students can understand the reason why they have to learn those subjects, in turn, they can have higher motivation for learning.

In order to find models for integrating career education with other academic subjects, first, we examined the current situations of career education with narrative inquiry method and survey from 1,000 teachers. In the next stage, we clarified the elements of career development competencies by executing delphi survey with 35 professionals. Cases of 4 countries(England, New Zealand, Canada, and Australia) for integrated career education with other subjects were examined. As the main conclusion of this study, two models for integration of career education with other subject areas were presented.

We clarified the concept of career development competencies, which are the elements to be connected with goals of other subjects. We analyzed the revised curriculum of 5 subjects(Korean, mathematics, social studies, moral and ethics, and technical-house management) and the elements that can be linked with career development competencies.

2. Main findings of narrative inquiry with students and teachers

In order to look at the current career education in schools, we inquired qualitatively, narratives of students and teachers. The findings of the narratives inquiry with students are as follows. First, mass media such as TV and internet are influencing career exploration of the youth. Second, support of parents is another influential factor on career choice. Third, psychological tests are still too much emphasized in school career education. Fourth, career education needs to be geared to more of experience based learning methods. Fifth, career education provided by schools is not so meaningful to students.

Implications drawn from the narratives inquiry of teachers are as follows. First, the current climate of schools is not amiable to career education. Students as well as teachers and administrators are not showing much interest on career education. The career education course, especially in high school, 'work and career' is not operating properly. In most schools, 'work and career' courses are taught by any teachers who are available regardless of their professionality. Though several researchers are emphasizing the necessity of integrating career education with other subjects, teachers are showing cautious attitudes toward the integrative approach.

3. Teachers' perception on career education in curriculum

The results of survey on career education with 1,000 teachers are as follows.

- Most of teachers(89.5%) agreed that career education need to be provided in the integrative way with other subject matters.

The way to integrate career education with other subjects should be either permeating career education elements into the contents of other subject(40.2%), or a chapter targeting career education can be inserted in other subjects' texts(39.7%). Providing additional recourse books for career education was perceived as inefficient.

60% of the contents of social studies and 50% of moral and ethics were considered as related to career education. Mathematics, English, and Korean were considered as not to share many elements with career education.

- In order to improve career education in schools, 35% of teachers answered that on-the-job training for career education should be provided to

more teachers. 20.3% of teachers answered that text for career education should be revised in a way to motivate students better.

55.3% of teachers are evaluating current career education positively. However, only 18.2% of teachers had participated in the training on career education. Also, 70% of teacher responded that there is not enough time for career education.

4. Foreign cases of Integrating career education with other subject areas

1) England

In England, there have been continuous efforts to facilitate the transition between school to work, and many of theses educational reforms are related to career education. Integrating career education with other subjects is one of the hot issues among discussions on career education. The followings are the implications that we can draw from career education in England.

National framework for career education is developed and provided to teachers, practitioners and other professionals.

- Quality standards for career education are presented and adopted in the process of implementing career education.
- The necessity of integrating various subjects with career education is emphasized and got wide agreement on it. Establishing partnership at a local level and developing programs geared to locality are emphasized.

2) Australia

Australian government developed a national level guideline for career education(ABCD, Australian Blueprint for Career Development). The State of New South Wales developed modules for the integration of career education with other subjects. In each modules, objectives, key themes, learning contents, and methods for integration are presented. In particular, methods for integration are presented in detail. In order to facilitate the application of ABCD in the curriculum, pilot applications were implemented, and the best practice cases were selected and disseminated.

5. Career Development competencies

Unlike other countries such as U. S. A., Canada, England, Australia, and New Zealand, Korea does not have an officially agreed guideline for career education, which includes the element of career development competencies. In this study, using delphi survey methods, we clarified the concept of career development and elements of career development. Elements of career development are as follows: 1) self understanding and positive self-concepts, 2) autonomous attitude, 3) positive attitude and values for work/ free from stereotypical concepts on gender roles and status of job, 4) positive interaction with others, 5) understanding the importance of balance among various life roles, 6) knowledge on various occupations, 7) career planning and management based on rational decision making, 8) utilization of accurate and reliable information on occupations 9) career planning based on changes of economical and social changes, 10) acquisition of academic diploma or qualifications required for their own career, and 11) endorsing and participating life-long learning.

6. Models for integrating career education with other subject areas

We analyzed the revised curriculum of 5 subjects(Korean, mathematics, social studies, moral and ethics, and technical-house management) and selected elements that can be connected with career development competencies. These tasks were conducted by committees for each subject composed of 3~4 teachers and a researcher.

For the selected elements which integrative approaches can be applied to, integrative objectives of learning were stated, and the best way to get to the objectives was also presented with a few sample cases for teaching.

The models presented in this study can be used by teachers as individuals or by a school in a cooperative way constructing school curriculum. In the process of integrating, we tried not to intrude the objectives of other subjects, and tried to avoid making an integration for itself. Integration should be applied only when integration can contribute to additive learning effects, not only for career education but also for other subjects.

Though the current models can be used in schools now, however, they are now at a pilot stage. Models will be improved through pilot application and more sample cases for teaching will be developed. In this process, many teachers will participate and by 2010, the final versions of models will come out.

9. Teachers' Perception on Career Education

Young-Im Maeng, Kyung-Hee Lim

The purpose of this study was to offer the advisable and tangible material for building a career education in curriculum model by investigating and analysing the perception on career education of teachers. For the purpose, 1,000 teachers of 200 schools were surveyed for identifying and explaining the reality of career education at the elementary and secondary school level.

The results of survey on career education with 1000 teachers are as follows.

- 55.3% of teachers are evaluating current career education positively. However, only 18.2% of teachers had participated in the training on career education. 70% of teacher responded that there is not enough time for career education.

- 69.1% of teachers agreed that teachers affect the student's career decision making.

- Most of teachers(89.5%) agreed that career education needs to be provided in the integrative way with other subject matters.

- The way to integrate career education with other subjects should be either permeating career education elements into the contents of other subject(40.2%), or a chapter targeting career education can be inserted in other subjects' texts(39.7%). Providing additional recourse books for career education was perceived as inefficient.

- 60% of the contents of social studies and 50% of moral and ethics were considered as related to career education. Mathematics, English, and Korean were considered as not to share much elements with career education.

- In order to improve career education in schools, 35% of teachers answered that on-the-job training for career education should be provided to more teachers. 20.3% of teachers answered that text for career education should be revised in a way to motivate students better.

Based on the results, this study points out the major problems in career education at the school level, and suggests the strategies to activate the career education.

10. A Study on How to Enhance Industrial Competitiveness of Higher Education

Yu-Mi Son, Chang-Yong Song, Tae-Joon Park, Hyun-Jung Lee

In a knowledge based society, the competitiveness of higher education, which serves core roles such as knowledge creation and human resource development, is directly related to the national competitive power. Hereupon, the members of OECD are promoting careful policies to reinforce higher education. Among these policies, a tendency, which approaches higher education as a growth industry in a knowledge based society, is increasing. An industrial approach to higher education is expressed as conflict between public interest and profit seeking. One may, however, find a solution to the controversy by focusing on strengthening the quality of higher education, which should be encouraged by creating growth in the industry.

South Korea's higher education industry suffers from factors such as lack of strategy in specialized universities, high cost and low efficiency structure, absence of valid competition, and weakening in autonomy of universities, which are caused by regulations. Also, the gravity of higher education in national economy and labor productivity fails to satisfy the standards of developed countries.

In order to evaluate South Korea's industrial competitiveness of higher education, four components, which are the scales of higher education industry, the weight in national economical, international revenue and expenditure, and research in higher education as well as educational competitiveness, were determined to be incorporated in analyzing panel data of 30 nations in OECD. In result, number of higher education institutions, number of students, and education expenditure were seen at their peaks in the aspect of South Korea's population and the scale of its economy, whereas the weight in national economy, international revenue and expenditure, and research and educational competitiveness appeared at its low. Australia and UAE recognize higher education as growth power industry, which is responsible for nation's future,

and are preparing and promoting strategies and plans in long term to foster higher education. Especially, the standard of quality in higher education, whose role is to ensure international reputation and its competitiveness, is cared with serious consideration.

Significance of higher education in a knowledge based society is predicted to take further important roles. Despite such international trend, however, it is evident that South Korea's higher education fails to achieve strong competitiveness. Fortunately, the debate on developing the educational service industry and regulating it to serve the goals of strategic industry, in order to secure the future national growth power, is occurring in a pan-ministries dimension; therefore, it is assumed that the educational service industry will contribute to strengthening the foundation of revitalizing the industry.

This research recommends 7 main plans to reinforce the industrial foundation of higher education based on the significance of higher education's industrial approach.

Proposal 1. Social consent for re-evaluating roles and functions of higher education

Proposal 2. Increasing financial status and efficient management for reinforcing higher education's competitiveness

Proposal 3. Reinforcing infrastructures for competing through means of publicizing information, changing methods of financial support, and etc.

Proposal 4. Financial support for researchers in a voucher form and promotion for specializing environment centered approach

Proposal 5. Broadening user's options through diversifying types of higher education

Proposal 6. Reinforcement of supporting internationalization of higher education and model development

Proposal 7. New development of higher education's competitiveness index

11. The Influence of Free Trade Agreements on the World of Work

Cheol-Hee Kim, Sang-Geun Han, Dong-Sun Choi,
Won-Geun Song, Yo-Haeng Lee

This study presents a comprehensive analysis of how free trade agreements affect the world of work in Korea. The authors did a stocktaking of FTAs Korea has either signed or is working on with a trade partner. Then, the influence of FTAs on the economy and the world of work was assessed. The study suggests alternative approaches of human resources development that can serve as effective response to shifts in industrial structure and the occupational landscape. It also offers suggestions including strengthening initial training of workforce in growing industries while focusing on retraining and job search assistance for those in industries with declining employment.

The KORUS and Korea-EU FTAs are expected to have significant economic benefits as the US and the EU each has a very strong services sector and an industrial structure that is complementary to Korea's. Foreseeable benefits include growth in trade and production, and strengthening of competitiveness in services. It should be noted, however, that in the case of EU with member countries of varying sizes of economy and levels of development, the tighter rules of origins, if applied, may undermine such benefits.

The KORUS FTA, meanwhile, will likely lead to raising the number of workers and employment levels in the services sector and the manufacturing sector with the exception of the food and beverage industry. Growth of employment is more likely in textiles, petro-chemicals and automobile industries on the manufacturing side, while in the services, similar development is expected in finance and insurance, education and health sectors. This implies that the industries that have traditionally led the Korean economy are expanding and commanding a greater market size. Korea, if successful in adapting to these changes, may benefit from a more competitive industrial structure and an expansion of the export market.

The Korea-EU FTA has the potential to lift the number of people newly finding employment in the manufacturing sector in general, while steel and metals, and machineries will be exceptions. The decrease in jobs in the steel and metals industry will mostly affect the production workers while in the machineries industry jobs in administration and management will also see a significant decline. In addition to the manufacturing sector, the services sector will also hire more people as a result of the Korea-EU FTA. This will fuel growth of demand for people with high skill levels and expertise, which will require systematic measures in preparation for such rise in skills demands.

The change in new employment in the various industries and occupations was forecasted by calculating the differences between the estimated new employment ratios in the industry and occupation matrix using the CGE model of capital accumulation and the ratios of existing employees based on OES.

The KORUS FTA will likely lead to a reduction in the number of employees in the manufacturing sector, especially the percentages of simple manual labor, machineries operators and assemblymen will dramatically decline. We anticipate a depletion of jobs with low skills requirements and a stronger preference for experts and people with proven work experience, which implies that the labor market will demand higher skills. Meanwhile, the impact of Korea-EU FTA will be similar to that with the US, leading to smaller hiring of the low-skilled people to perform simple tasks in favor of the more skilled and experienced.

The researchers also surveyed workers employed in occupations and/or industries where influence of the FTA is most likely to be significant. Based on the surveys we concluded, above all, that the changes brought on by the two FTAs will include greater demand for knowledge workers, which requires that more competent talents need to be attracted and trained to be ready to meet such demand. Second, a need was identified for the development and implementation of programs assisting workforce to make a smooth career transition from sectors where there will be reduction in jobs. Third, the automotive and its ancillary industries should be supported by policies, including those designed to strengthen the vocational competency of human resources in these sectors. Fourth, in-depth research should be conducted on the various occupations that may rise to importance or newly emerge as a result of the FTAs. Respondents also pointed out the vital need for individuals to have specialized sector knowledge and general skills such as in foreign language proficiency. These findings all shed light on what direction future policies

should head, which should be geared to making the competent workers available where they are in demand the most.

A number of conclusions were drawn based on the above findings about how the KORUS and Korea-EU FTAs will affect the world of work as well as the survey of experts in the respective industries on potential increase and/or decrease of employment and on newly emerging occupations.

First, there is a need to secure technological competitiveness which in turn requires training of people to develop the expertise essential for maintaining and further developing that competitiveness. With FTAs, technological clout will be the ultimate determinant of competitiveness, and as a result, sectors with low technology levels will become less competitive. Therefore, ongoing endeavors should be made to develop talents with capabilities to conduct R&D and attendant tasks, which should include efforts to develop and disseminate training programs designed for this purpose.

Second, there should be investment into expanding export markets, with a special concentration of resources in areas where Korea already has a competitive edge. We should build on these areas to expand the competitiveness scope while leveraging them as the basis for building global businesses.

Third, it is extremely important to enhance adaptiveness to market shifts and to strengthen individual capabilities. FTAs are structured in ways that expose the two partners to the influence of changes in the economic and labor market conditions of the other. This means that the ability to respond to diverse changes in the trade environment is critical. At the same time, the individual worker needs to enhance his vocational competency, professional knowledge and foreign language proficiency to keep him competitive.

Fourth, the constant shifts in the labor market demand the ability to adapt flexibly. Based on the analysis of impact on industrial and occupational composition, there will be an increase in employment opportunities for skilled workers as well as in low-skilled and simple task jobs, and in multinational companies. These are essential changes in the nature and quality of jobs in industries most affected by the FTAs, which will inevitably affect the ancillary and downstream industries and ultimately the labor market as a whole.

Fifth, there is the possibility of bi-polarization in the industries and employment, requiring systematic response. FTAs will reorganize the market and the industries in ways that will bi-polarize the participants. The larger businesses that have accumulated competitiveness will dominate the market while the SMEs

with competitive disadvantages will face difficulties surviving the changing market conditions. As such developments take place, the market participants need to invest more into securing expertise and competitiveness.

Finally, there needs to be a focus on globalization and standardization. Market liberalization is naturally accompanied by emergence of global standards. Korea must pro-actively embrace such global standards and develop strategies and frameworks across its industries to assume leadership in the global market.

12. Developing the Mutual Cooperation for HRD between Large Companies and SMEs

Mee-Souk Kim, Eui-Kyoo Lee, Jin-Mo Kim

This study aims to promote and encourage the human resources development of small and medium enterprises. The objectives are identifying the cooperation between large companies and small and medium companies and finding the ways to cooperate. The results are as follows. First, the subcontract SMEs are bigger and more secure than non subcontract-SMEs. Second, the parent companies do not have the supporting system of HRD for subcontract firms. Third, the parent companies need to support the subcontract firms in long-term perspectives. Finally, the parent companies must have mutual cooperation with small and medium enterprises.

13. A Study on Forecasting Future Skills Requirements

Ho-Young Oh, Gue-Hee Whang,
Mi-Ran Kim, Jin-Young Kim

In recent years, the Korean economy has experienced rapid transition into knowledge-based economy, more severe competition from open-door policy than before, and intense technological innovation. These changes are leading to changes in the socio-economic structure and, as a result, the uncertainty and instability surrounding the world of occupations are higher than ever before, especially in required skills from employers. For households, businesses, educational institutions, and government to respond actively and effectively against the rapidly changing skills requirements, it is important and urgent to forecast the trends of future skills requirement.

The main objective of this study is to develop a forecasting method for future skills requirement in both each occupation and economy as a whole. For this purpose, we have developed some experimental measurement method for skills imbalance which is decomposed into three different categories such as skills shortage, skills mismatch, and skills gap. Skills shortage captures quantitative mismatch, where labor demand for specific skills exceeds labor supply with those.

Skills mismatch is defined as coexistence of over-supply and over-demand for manpower with specific skills at the same time. Higher youth unemployment with labor shortage in the small & medium enterprise is the typical example of skills mismatch, where youth doesn't like to work under unfavorable working conditions. Skills gap exists when there are lots of job seekers with skills, but their acquired skills do not match with skills requirements from employers. Former two imbalances is mainly concerned with quantitative aspect of labor market imbalance, but the last one is distinguished as it is resulted from qualitative aspect.

Based on these conceptual frameworks, we have developed 'Employer Skills Survey' and conducted pilot survey for 163 companies with hiring experiences

for newly graduated from 4 year universities in 2007. According to the results, skills imbalance explains about 8.9% of total newly hired 4 year university graduates in 2007 and in case of professionals' occupation, and in particular, reached 19.5% of the same figures. This means that lots of job vacancies are resulted from insufficient skills formation from educational sectors and youth unemployment among 4 year university graduates is able to be significantly lowered with appropriate education in universities. To overcome mismatch in skills developed at educational institution with requirement from employer, identifying and forecasting actual & required skills for each job is most important. Based on this education-labor market linkage information, curricula and teaching methods in educational institutions should be aligned.

14. Support for North Korea's Human Resources Development(HRD) Efforts and Cooperative Measures

Il-Gyu Kang, Eui-Kyoo Lee, Hye-Won Ko

The relationship between the two Koreas has undergone numerous changes since the division of the country. Relations between the two Koreas have fluctuated in accordance with the wider changes in the international environment. More to the point, while the 20th century can be defined as the era of competition and hostility between the two Koreas that occurred amidst the wider Cold War and ideological war between East and West, the general environment for the unification of the Korean peninsula has improved in the 21st century as international and domestic tensions have eased, and an overall atmosphere of reconciliation and cooperation has been formed.

In this regard, the development of human resources can be viewed as one of the essential fields on which South Korea should focus as part of its efforts to promote a cooperative atmosphere and increase private sector exchanges. This must be done to not only activate exchanges and cooperation between the two Koreas as a whole, but also to bring about mutual development. Korean enterprises have in particular shown a great deal of interest in gaining access to North Korea in the aftermath of the 1st and 2nd North-South Korean Summits. Furthermore, this overall easing of tensions has paved the way for the advent of various forms of support and cooperation. To this end, support and cooperative ventures will have to be undertaken in many fields in order to foster the development of North Korean industry, and maximize the investments that have been made by Korean enterprises already active in North Korea.

The North-South Korean relationship can be regarded as having moved beyond the serious conflicts and struggles of the past and entered a new stage of cooperation. In this regard, both the international and domestic situations have become more conducive to the fostering of North-South Korean cooperation. Under these circumstances, exchanges and cooperation between the two Koreas must be carried out in various fields. While cooperation and the

provision of support to North Korea will be necessary in the short term, there is also a need to draw up a road-map for peace and prosperity on the Korean peninsula that is based on long term exchanges and cooperation.

Viewed from this vantage point, it becomes evident that the provision of support and cooperation in the field of North Korean HRD represents a very important and urgent task where the wider social and economic development of North Korea is concerned. There is an evident dearth in North Korea of HRD related elements such as facilities, equipment, related materials, and teaching staff. In addition, our study revealed that these problems will be all but impossible for North Korea to resolve based solely on its own economy and policy measures. It is essential therefore that external support and cooperation to be secured. In this regard, the provision of support and cooperation in the HRD field should be carried out in various forms, and involve vocational education & training assistance that are based on such factors as individual variables, stages, targets, and regions.

The following general suggestions can be made with regards to support and cooperation. First, a comprehensive implementation system pertaining to support and cooperation in the field of North Korea HRD must be put in place. Second, as far as the provision of support to North Korea is concerned, there is a need to reestablish the roles of the government and private sector. Third, HRD support should be linked to the social and economic development of North Korea. Fourth, the provision of support and cooperation in the field of HRD must take place within an environment in which a clear link exists between support and cooperative oriented ventures. Fifth, support in the field of HRD should be based on the diversification of policy implementation methods so as to ensure that they reflect the overall goals of providing support to North Korea.

15. Challenge to the HRST Policy: Focusing on High Level HRST

Chang-Yong Song, Mi-Sug Jin, Soo-Young Lee,
Gyu-Hee Hwang, Jae-Seek Jeon, Ki-Bum Park,
Mi-Jung Eom

This study aims to verify the characteristics of PhDs in natural science and engineering, and to propose the policy implication for their cultivation and practice.

Overview of the discussions on challenges to the HRST shows that the phenomenon of the challenge to the HRST is quality-downgrading, and that the cause of these phenomena is not very clear. The research suggests that the avoidance of studying S&T should be derived from the common thought on the challenge to the HRST. Overall, the manpower projection of HRST shows over-supply in college level, under-supply in graduate level, and significant under-supply in PhDs in engineering.

Diagnosis of government HRST policy suggests that the direction of government HRST policy is superficial and limited as it has been oversimplifying the issues related to the avoidance of studying S&T. The current policies lack proper understanding of the fundamental problems of why expected students avoid S&T and concentrates too much on the welfare and income policies. The research argues that the limitation of good job for HRST itself causes the avoidance.

The research brings the policy implications as followings. First, the solution to quality-downgrading of HRST should be prepared through the overall reforming of high-educational system and institutions. Therefore, the competitiveness of the university must be strengthened. Second, the diverse career path for HRST should be provoked by establishing proper reward system and promotion system.

16. A Scheme for the Linkage of Welfare, Learning and Employment Services at the Regional level

Hye-Won Ko, Young-Hoon Oh,
Yeo-In Yoon, Keun-Sei Kim

This study is designed to present policy considerations for network formation and linkage reinforcement by inspecting the linkage between learning, employment and welfare services for welfare beneficiaries at the regional level. To achieve this purpose, we analyzed the existing data and literature in this area, including both domestic and foreign case studies, held consultations with experts, conducted in-depth interviews with officials at 9 service institutions and with 10 service users, and gave questionnaires to 90 service institutions and 300 officials in service institutions.

As case studies, we analyzed One-Stop Center in the United States, Centre link in Australia, and Job centre Plus in the United Kingdom, to study the realities of attempts at cooperation and linkage in service institutions abroad. Our findings indicated that while there is a major global trend to attempt to link employment and welfare services with each other, the linkage between services is not always based on institutional integration, but can involve a functional integration and close business cooperation between programs.

Through our in-depth interviews, we determined that linkage was uniformly made between job centers and outside institutions at the national level, while the linkage of services has only emerged recently little by little, showing regional characteristics. Rehabilitation centers(Jahwal Centers) were linked with government ministries and agencies through the funding of projects by the Ministry for Health, Welfare and Family Affairs(MIHWAF), the Ministry of Labor(MOL), and the various local governments.

Through our in-depth interviews with welfare beneficiaries, we determined that age and health were major hindrances to the employment of welfare beneficiaries. We determined that first of all, the infrastructure for consulting

should be well built; furthermore, for employment support services for welfare beneficiaries, employment through training, and particularly services corresponding to personal needs should be offered. In addition, support should be provided to give stable jobs by offering continuous services based on personal case management.

Through surveys of the service institutions and officials, we determined that both job centers and resident centers(Dong Offices) were not so closely linked with each other, and even when linked with each other, they were not so highly satisfied with each other.

Such findings required the following policy directions. In general, the linkage between learning, employment and welfare can be explained in a manner that leads to employment on the basis of the learning of welfare beneficiaries. While efforts have been made to link them with each other, the linkage is weak in terms of level or result. First, these problems should be actively resolved at the national level, which governs the communication system of services. Second, the employment problems of welfare beneficiaries should be resolved through a multilateral networking approach, a household approach and a regional labor market centered approach in light of the complexity of the issue. Third, it is not necessary to seek compulsory institutional integration when there is a complete separation between service institutions, such as the existence between the employment and welfare service institutions in Korea, since each individual service institution has expertise in its own area of service. What is important is not institutional integration, but functional integration.

17. A Study on the Vocational Training Financing System

- Focusing on the Role of Social Stakeholders -

Young-Sup Choi, Ahn-Kook Kim, Cheol-Hee Kim,
Josep Oriol Escardibul(University of Barcelona)

1. Purpose and Outline of Research

This report deals with the issues about the theoretical aspects of the vocational training financing system and detailed case studies of developed countries' training financing system. While the transition to the knowledge based economy is accelerating, the importance of lifelong vocational training is increasing as well. To deal with this challenge, most countries are trying to find the ways of effective public intervention in training system. Various financial measures are implemented to reduce the financial constraints and also to stimulate the training participation. There also exist diverse problems of financial intervention. For example, possible inefficiency stems from the unnecessary financial subsidy given to those who are capable of paying all the costs and do not need financial support at all. Furthermore, it is not too difficult to find other causes of policy failure with regard to the training financing policy which is aimed at increasing the national competitiveness and enhancing the social integration. In this regard, financial intervention in the training system should be examined carefully considering the favorable effects on one hand and its possible problems on the other.

In this respect, along with the theoretical considerations with regard to the vocational training financing system, we studied the experiences of developed countries. In particular, we explored the training financing systems of Spain, France and Japan. They implement training levy system at the national level which is basically similar to that of Korea, and especially the role of social stake holders is said to be relatively strong in Spain and France. Considering the necessity of enhancing their role related to the establishment of demand-led training system in Korea, detailed examination on the experiences of both

countries would provide us valuable information on how to increase the influences of social stake holders and training financing system which is more decentralized and less bureaucratic.

2. Theoretical Issues of Vocational Training Financing System

First of all, we examined the arguments about the need for public intervention in vocational training system and specific forms of such intervention as well. The research showed that several factors could be considered as the rationale of public intervention including under investment due to short-sightedness of employers and workers and poaching problem that non-training firms recruit trained workers from training firms resulting unreasonable benefits to non-training firms and training disincentive to training firms.

Despite various necessities for public intervention to training system, rigorous empirical analysis on the effects of such intervention was found to be rather limited comparing to abundant studies for the effects of training itself. Since drawing out effective policy measures from such limited empirical studies would be difficult, it seems quite necessary to initiate detailed studies embracing various issues related to the training financing system. Following issues can be considered: the validity of placing compulsory levy on the whole employers/employees for the support to relatively small fractions of training participants, training inducing effects of grants or subsidies given to employers and workers and cross-subsidization effects that the relatively disadvantaged groups support the relatively advantaged groups.

3. Spanish Training Financing System: Training Levy-Grant System

Training financing system in Spain is a levy-grant system, based on a compulsory training levy paid by companies and employees. The compulsory training levy is compulsory and 0.7% of the gross payrolls of which employers pay 0.6% and employees cover 0.1%. In addition, the European Social Fund(ESF) also accounts for approximately one quarter of the total training budget. Since 1993, training activities for the unemployed(Formación occupacional) and the training activities for the employed(Formación continua) have been financed by compulsory training levy and ESF contributions. In 2007,

Formación occupacional and Formación continua merged into a single system, training for employment(Formación para el Empleo). The financial support is provided to employers-driven training activities for theirS own employees (Formación Demanda), supply-driven training activities for the employed and the unemployed(Formación Oferta), and complementary training related activities.

Training financing system is governed by the cooperation of central and regional governments, and social stakeholders. Sectoral and regional allocation of training budget is guided by General Council of the National Employment System which is composed of representatives from central government, local governments and social partners. At regional level, each regional government has certain autonomy and responsibility of supporting required training within their region using its own financial resources and subsidies from central government.

As for the role of social stake holders, following the first National Agreement on Continuous Training(Acuerdos Nacionales de Formación Continua, ANFC) between employers' organizations and labor unions in 1992, representatives from employers associations and labor unions have been actively participating in the management process of training financing system. In particular, to manage the financial support for the training activities at the national level, FORCEM(Fundación para la Formación Continua) was created as a bipartite organization governed by the representatives from employers and trade unions. Today, social partners participate in the management of FTFE(Fundación Tripartita para la Formación en el Empleo)which is the successor of FORCEM and are playing a key role with regard to the overall management of training financing system.

Policy implications of Spanish training financing system to South Korea can be summarized as followings. First, compulsory training levy-grant system could be effectively utilized to draw the interest and active involvement of employers and trade unions. Second, active participation of social partners could contribute toward the reduction of bureaucratic costs related to the training levy-grant system. Third, as the participation of social partners may not always bring out the positive effects, some measures should be implemented to ensure effective use of financial resources. Finally, it is important to establish the system in which the training activities at different levels, that is, the training activities at the national, regional and sectoral level are mutually adjusted and harmonized.

4. French Training Financing System: Training Levy-Exemption System

France is similar to Spain in a sense that it also has a compulsory training levy for the employers. However, French training financing system is different from that of Spain as it runs a levy-exemption system in which training levy can be reduced or exempted once the employers spend amount of training expenses above the level set by government. In 1971, the Vocational Training Act stipulated that every employer with more than 10 employees should pay 0.6% of total payroll to the sectoral training funds, OPCAs. Since then, the levy rate has continued to rise up to the rate of 1.6% nowadays. The noticeable feature of training financing system in France is the active financial support to individual-led training activities through Individual Training Leave and Individual Training Rights. Individual Training Leave entitles employees to the rights of one year training leave, and Individual Training Rights allow 120 hours per year for their own training activities.

The most important implication of the French experiences is the tradition of close cooperation between employers and trade unions on the issues of vocational training. The training levy is managed by the sectoral training funds which are governed by bipartite committees, and the government legislation is based on the mutual agreement reached by the social partners. Considering the unstable industrial relations in Korea, it is unlikely to achieve the close cooperation between social partners in the near future. Nevertheless, however difficult it may be, it is clear that such cooperation is essential for the success of training and labor policy reform. Another policy implication is the necessity of stimulation for individual-led training. Financial support and legal entitlement of individual-led training will contribute not only to the elevation of training participants' skills level, but also to the enhancement of social equity by guaranteeing more equitable access to the training opportunities for every workers.

5. Japanese Training Financing System: Training Levy-Grant within the labor Insurance System

Current Korea's training financing system is quite similar to that of Japan. That is, the training financing system is operating as a sub-system of the

Employment Insurance system which combines unemployment insurance system as the passive labor market measure and subsidies for continuous training and employment stabilization programs as the active labor market measures. In addition, the role of central government is considerably stronger than those of other developed countries with regard to the training policy management process. It is different with South Korea, however, in that local governments have more active roles in planning and delivering training programs in Japan.

Subsidies for the training programs are funded from general tax and training levy which is collected as a part of labor insurance fee and it takes up the biggest part of the training budget. According to the law of labor Insurance, labor Insurance fee is 1.5% of total payroll and is paid by employers and employees. 0.9% is paid by the employers, of which 0.6% is mainly for the unemployment compensation and 0.3% is for the 'two initiatives', public training programs and employment stabilization programs. The employees pay 0.6% of their total payroll mainly for the unemployment compensation. Most of the public training programs for the employed and unemployed are financed from the 'special accounts for two initiatives' funded by the contributions of employers only. Besides the training subsidy for the public training activities, there is Education and Training Subsidy given to the employees who are participating in training activities on their own. This is to reimburse some of their own training expenses and it is funded from the accounts of unemployment compensation paid by both employers and employees.

As for the management of training financing system, the role of social partners is said to be limited compared to the cases of western countries. These days, to enhance the responsiveness of the public training system to the local training demand, Japanese government suggested the reform of current centralized training system into a more devolved system in which more active role of regional and local governments are expected. It suggests that, to deal with the rapid change of economic situations, it is strongly required to make the training system more flexible and responsive to the training needs.

6. Policy Implications for the Reform of Korea's Training Financing System

Drawing on previous discussions about training financing system, we can

summarize policy implications as followings. First of all, robust empirical analysis about training financing system should be far more advanced to make a success of training financing system reform. Despite various theoretical suggestions for the public intervention into the training system, there are limited studies which empirically prove the validity and evaluate the effects of such intervention. Without far more advanced empirical studies on these issues, it would be very difficult to expect the desired results being brought out from the reform of training financing system.

Second, it is necessary to establish the cooperation system between employers, employees and government to enhance the efficiency and equity of training system. In Korea, central government alone has exercised strict and detailed control over almost every aspects of training system until now using the compulsory training levy. The result of such centralized system has been low efficiency of public training activities and excessive bureaucratic control over the subsidized training activities. To address these problems, it is required to decentralize the policy making system allowing the active participation of social partners into the governing body, especially the governing body of the training financing system. Such changes will contribute to reducing the unnecessary bureaucratic cost of the training levy system, increasing the effectiveness of the financial resources in the vocational training as well as raising the social equity of training policies.

Third, training co-financing schemes between employers, employees and governments should be developed to allow more autonomy and discretion of the training participants and on the other hand to guarantee more efficient use of training financial resources. Of course there already exists a case of co-financing scheme in Korea, applied to the support for employer-led in-company training activities in a form of training cost reimbursement scheme. However, co-financing scheme for self-directed training is just emerging in a form of individual training voucher for the unemployed and individual training allowances for the employed. From the experiences of the developed countries, successful implementation of those co-financing schemes depend upon the procedural simplicity and transparency. In this regard, it is strongly required to reform the current training levy-grant system with the direction of less bureaucratic control, more active participation of social stakeholders and more autonomy based on the co-financing of training participants and government. Undoubtedly, it should be kept in mind as well that since strict requirement of

co-financing may have adverse effects of excluding socially disadvantaged groups with limited financial capacity, there also exists the need of special public programs to support those disadvantaged groups requiring no or little financial contributions.

18. A Study on the Introduction of Lifelong Learning Accounts

Nam-Chul Lee, Ji-Sun Chung

Knowledge-based economy is creating a strong demand for workers who are educated, highly skilled and ready to learn. Lifelong Learning Accounts (hereafter, LiLAs) are a promising new strategy to promote lifelong learning. LiLAs support government as a way to keep workforce competitive and provide working Koreans with education and training needed to advance their careers. Current status of lifelong learning in Korea lack lifelong learning infrastructure and attendance, insufficient of administrative and financial support for lifelong learning opportunities for adults.

Recently, Ministry of Education, Science and Technology(MOEST) and Ministry of Labor(MOL) are working to support existing LiLAs(Lifelong Learning Act) and to lay the groundwork for future LiLAs initiatives.

Korea government introduced LiLAs to establish national policy for promoting lifelong learning. This demonstration is affiliated with the Lifelong Learning Act partnership, which is a nation-based coalition that includes individuals from the public sector, private sector, trade association, local workforce boards, community-based organizations, NGO, and university.

Korea's LiLAs program is different from that of traditional job training programs as it allows individuals to plan and inform decisions for investing in their own future. The aim of the scheme is to boost skills for adults with or without qualifications and low income. More specifically, the core objectives of LiLAs are: to promote and support lifelong learning through repeated use of LiLAs, to assist in broadening participation in learning, to encourage take-up from those who face financial barriers for training by offering a higher financial inventive for those with low income, to encourage people to take responsibility for their learning by making a personal commitment measured in time for some and financial terms for others.

Learning Accounts of MOEST and Vocational Ability Development Accounts

of MOL have different names and objectives. However, they have provided a unique opportunity for employers and employees to work together to improve career related education and training.

LiLAs system should have the following features. First, individual workers are eligible for accounts. Second, individual participants choose the training and education. They need to meet their career goals based on a learning plan developed with education and career advisors. Once the support for lifelong learning is initiated, it first takes the form of a lifelong learning system such as LiLAs. LiLAs system which is a mechanism that guarantees the right of an individual to learn throughout his/her lifetime. On the national level, it is a mechanism that supports individuals to achieve the learning objectives more effectively, as part of a means for individual learning. Therefore, the LiLAs system actually guarantees the learner's opportunity to learn as well as his/her right to learn, a right, which is socially certified for the result of an individual's learning.

19. Strategies for the Development of Converging Technology Scientists and Engineers

- Focusing on Biotechnology-based Converging Technologies -

Soo-Young Lee, Tea-Jung Ha, Yang-Kyung Sung

Converging technologies refer to the synergistic combination of different science and technology areas including nano-bio-info-congo. Converging technologies are the results of not just a physical combination but a chemical combination of element technologies, which create unique characteristics that are different from the original elements. In spite of the increasing importance of converging technologies in enhancing nation's competitiveness, it is rare to find studies on the development of emerging scientists, engineers and workforce in converging technologies. To this end, the purpose of this report is to provide strategies to develop scientists and engineers in converging technologies that will meet the demands of new R&D trends and industrial needs.

Through this report, we tried to answer the following questions; What are the implications of unifying sciences and converging technologies? How will scientific knowledge and current technologies evolve and what emerging development are envisioned? What are the most pressing education issues that require immediate attention? How can we develop a transforming national strategy to enhance individual capabilities and R&D competitiveness?

In order to meet the challenges of converging technologies, most of all, science education at all levels needs radical transformation from elementary school through post-doctoral training. Furthermore, new forms of educational institutions will be necessary. The creative development of converging technologies requires people who understand multiple fields in depth and can intelligently work to integrate them. The current educational system that is based on separate scientific disciplines and fields of engineering can not provide adequate learning environments for the future scientists and engineers of converging technologies.

The followings are recommendations to enhance the development of scientists and engineers of converging technologies.

First, scientists and engineers at every career level should gain in-depth knowledge and skills in one scientific discipline or a field of engineering and in neighboring disciplines to broaden their understanding and perspectives. Scientists and engineers should have opportunities to collaborate and cooperate with colleagues in diverse fields to share their understandings and learn from one another. Scientists and engineers of converging technologies should be risk-takers who are not afraid of trying new approaches, and should have creative and open mind to go beyond the conventional understandings.

Second, in order to educate scientists and engineers of converging technologies and to train the technical labor force for the future, the current discipline-based curricular and departmental organizations of schools at all levels should call for a major reform. The walls between disciplines and departments need to be removed to promote a better flow of knowledge, skills and people.

Third, government should establish a national research and development priority on converging technologies and provide financial supports for scientists and engineers of converging technologies. In particular, government should provide support in establishing infrastructure for conversing technologies and coordinating the work of various research institutions and universities, which can enhance multidisciplinary scientific and engineering efforts.

Last but not least, a new cultural norm should be accepted throughout the professional communities of scientists and engineers. Opportunities of working across disciplines and interdisciplinary training and communication need to be further encouraged.

20. Study on Establishment of a System to Evaluate Operation of the Qualification System

Dong-Im Lee, Duk-Gi Kim, Sang-Ho Kim

1. Study background

In order for qualifications to work properly in the fields, the government should be able to make correct analysis on system operation of at least those qualifications governed by law. However, appropriate analysis is not being made as there is a lack of infrastructure required for the evaluation and as authorities concerned do not have strong motivation or capability. Considering this, setting aside the achievement analysis of the qualification system as a mid-and long-term challenge, this study aims to provide guidelines on qualifications management and operation to individual authorities so that they can establish independent evaluation frameworks for systematic management and operation of qualifications.

2. Study results

1) Framework for operation of the qualification system

For evaluation of the operation of qualification system, the scope and contents of operation should be first defined. For this purpose, subsystems of qualifications were drawn according to the “system approach”, “management system”, “operation system”, “utilization system” and “support system.” Based on these subsystems, an analysis was made on the current operation status of foreign qualification systems as well as on the current operation and operation evaluation status of the Korean qualification system. Along with these efforts, an evaluation system for operation of the qualification system was set up.

2) Current operational status of the qualification system and evaluation status of the operation

□ Current operational status of the qualification system

Several issues are pointed out as problems in operation of the Korean National Qualifications System. First of all, as new qualifications have been introduced without giving full consideration to utilization of the qualifications, they have failed, in many cases, to meet social needs(problem in the management system). Also, in case of national qualifications under individual law, great gaps exist among organizations managing qualifications in their management and operation capabilities and many of them are carrying out qualification tests not based on those rules, guidelines or manuals associated with national qualification tests but only on internal approvals(problem in the operation system). In addition, while many national skills qualifications and national qualifications relate to similar job fields, many differences exist in their utilization governed by the law, and moreover, they are poorly utilized(problem in the utilization system). Meanwhile, in the case of national qualifications under individual law, guidelines on management and operation of the qualification system specified in the law are provided to various authorities in different forms thus resulting in a lack of united framework to secure reliability and credibility as national qualifications(problem in the support system).

□ Current evaluation status of operation of the qualification system

In this study, a survey was conducted toward all relevant ministries on how each of them are managing operation of the qualification system on a quality basis; the first of its kind. Looking at the results, the quality management by individual ministry for operation of the qualification system was found out to be inappropriate in general. As for the management system, about 30% of the surveyed ministries noted as not having a plan for qualification management and operation and only about 40% understood the demands for qualifications in industry fields(management system). Also, less than a half(46.4%) of the surveyees were evaluating operational conditions at test organizations(operation system) and only 42.9% were evaluating the utilization level of qualification items(utilization system). About 57.1% of the respondents said that they were regularly reviewing and assessing the test system for qualifications(qualification

application requirements, test methods, test subjects, level system, etc.)(support system).

3) Operation evaluation of qualification systems in other nations

In order to understand the current status of operation evaluation of qualification systems in other nations, cases of the US, Australia, Japan and the UK were analyzed. As a result, it was found out that the operation evaluation of the US qualification system was focused on the "support system" of qualification, while Australia rather stressed the "management system" and the "operation system". On the other hand, the evaluation in Japan was more oriented by the "management system" and the "support system" and the UK emphasized the "management system", the "operation system" and the "support system".

4) Establishment of a system to evaluate operation of the qualification system

□ Bases for evaluating operation of the qualification system

The first basis is purpose of evaluation, which is to help individual ministries to effectively manage and operate national qualifications meeting desired purposes and by doing so to make the society more oriented by lifelong learning and competency and to raise international status of qualifications.

The second basis is evaluation object, which is national qualification. Private qualifications are created according to market demands and are not subject to management by the government. Therefore, the focus of evaluation is set on the qualifications directly managed and operated at the national level. The qualifications issued without test to those who complete education courses are excluded here.

The third basis is evaluation unit. Analysis could be made based on each ministry or relevant law but the evaluation unit here is basically the item because evaluation by item is required in order to understand how well qualifications are utilized.

The fourth is evaluating body. In this study, the body assessing operation of the qualification system is each ministry which directly manages qualifications

and the Ministry of Education, Science and Technology(hereinafter called "the MEST") which governs overall management of qualifications. Individual ministry makes independent evaluation on the results of qualifications management and operation, based on which the MEST makes comprehensive evaluation.

The fifth is evaluation cycle; every three years. Annual evaluation is not necessary considering costs and changes in qualification related skills and as basic plans are set every three years, it is desirable to conduct the evaluation in the final year of the three-year basic plan.

The sixth is utilization of the evaluation results and expectation effects. The evaluation results can be utilized for promoting management and operation of the qualification system by providing feedback in the course of preparing basic/execution plans for the next year. In addition, the utilization level of qualifications identified through the evaluation will serve as a valuable source of information for users. These are expected to bring some positive effects in such as improving legal and test systems regarding establishment, management and utilization of the qualification system, making qualifications better reflect demands at industry fields and enhancing international currency of qualifications.

□ Evaluation criteria

Evaluation scope		Evaluation criteria
1. Qualification management system	Survey and research (monitoring)	· Appropriateness of the survey and research
	Qualification information system	· Appropriateness of the qualification information system
2. Qualification operation system	Test plan	· Existence of an execution plan
	Question development	· Appropriateness of the secured pool of question developers/reviewers · Appropriate selection of question developers/reviewers · Appropriateness of test questions · Security and confidentiality of the examination content in the question development process
	Execution of test	· Appropriateness in selection and nomination of overseers
	Grading	· Appropriateness of the measures to prevent cheating · Appropriateness of the grading work · Appropriateness of question analysis
	Post management	· Appropriate management of those who pass the test · Appropriateness of civil application management
3. Qualification support system	Organization structure human resources included)	· Systematic structure of the test organization · Expertise of the personnel in charge
	Budget	· Appropriateness of budget allocation
	Law	· Appropriateness of the law and internal guidelines
4. Qualification utilization system	Satisfaction level of acquirers	· Satisfaction level of qualification acquirers
	Satisfaction level of businesses	· Satisfaction level of businesses
	Employment status of acquirers	· Employment status of acquirers

The criteria developed in this study for in-house evaluation of the qualification system at each ministry are as below.

□ Comprehensive evaluation by the MEST

The MEST as a head ministry in charge of general management of the qualification system should make a comprehensive evaluation regarding operation of the qualification system mainly according to three phases. First in the short-term, it should put together all the results of evaluations individually done at each ministry. Secondly in the mid-term, it should be ready for the evaluation on execution results of the basic plan for qualification management and operation. Finally in the long-term, it should assess the operation achievements in general of the qualification system.

3. Conclusions

1) Measures to improve evaluation of the qualification system operation

The measures to improve in-house evaluation by each ministry presented for the short-term period are as follows. First in the qualification management system, the qualification survey and research functions should be strengthened. It is necessary to set up a system that enables monitoring of external environmental changes by forming a network to observe changes in job duties of each industry and to identify skill demands at industry fields.

Second in the qualification support system, relevant laws should be revised for effective operation of the system. Also, it is urgent to prepare a set of standards against which determinations can be made on whether the test system, an integral part of the qualification law, is appropriate.

Third in the qualification utilization system, it is needed to set up an infrastructure in order to be able to make quantity(objective) assessment of the qualification utilization level or achievements through which evaluations should be made at the individual and business level and at the macro level.

2) Other policy recommendations

In the mid- and long-term, the MEST needs to prepare evaluations as follows. First in the mid-term, it should come up with measures to evaluate the 1st basic plan for management and operation of qualifications under the Framework Act on Qualifications. Second in the long-term, it should make an achievement

analysis on the qualification system across the board. Third, in order for correct and credible evaluations made in the long-term, it is essential to set up a database with various data required for evaluation. Fourth, an evaluation body with neutrality and expertise should be put in place.

3) Roadmap for evaluation of the qualification system operation

In a current situation with a lack of interest, capability and awareness in the part of ministries, independent evaluations by ministries is an option to evaluate the qualification system in the short term. Also with the poor administrative database and evaluation methodology, there are limitations in properly conducting quantity and objective evaluations. Therefore, independent quality evaluations at ministries should be done in the short term followed by quantity(objective) evaluations in the mid term, while the MEST carries out evaluations on the basic plan. In the long term, the MEST should make comprehensive evaluations on achievements in operation of the qualification system.

21. Measure to Reinforce the Efficiency for Management and Operation of National Qualification Testing: Focused on the Model of Management and Operation

Jeong-Yoon Cho, Hyun-Soo Kim, Young-Real Choi

The purpose of this study is to develop measures to improve the efficiency for management and operation of national qualification testing.

In order to attain the objective, first, this study has carried out theoretical studies to prepare the principal system of managing and operating qualification testing in the light of 1) qualification testing-related system, 2) the structural elements of qualification testing management and operation, 3) prototype of managing and operating qualification testing, 4) supply-demand relationship of successful candidate.

Second, this study has conducted the analysis of current situations and problems of national qualification testing in terms of management and operation. It covered 4 Korean professional qualifications such as architect, lawyer, accountant, and medical doctor.

Third, this study has benchmarked U.S. qualification testing in parallel with 4 Korean qualification testing already mentioned. Comparing between Korean and U.S. qualification testing, this study has found useful suggestions to Korean professional qualification testing how to improve efficiency of managing and operating qualification testing.

Fourth, this study has conducted Delphi study to certificate holders of architect, lawyer, accountant, and medical doctor to prepare findings on efficient model of managing and operating qualification testing. When preparing questionnaire both of Korea and U.S. qualification testing system had been considered.

Fifth, this study has demonstrated the efficient model of managing and operating national qualification testing in terms of implementing qualification testing and controlling the quality of testing according to the difference of awarding bodies(public or private), qualification testing field(science and

technology, humanity & society), and combination of education & internship prior to qualification testing under absolute assessment.

Finally, this study has suggested policy recommendations to strengthen the efficiency for management and operation of qualification testing as follows:

- To change qualification testing system to be harmonized with global standards

- To prepare internship carefully before and after pre-testing for acquiring qualification. When preparing internship there are many important factors being considered. For example, 1) development of education and training program for internship, 2) designation of monitoring organization for internship, 3) qualification requirements for instructor to lead intern, 4) establishment of organization for internship, etc.

- To limit opportunities and period for application of qualification testing to reduce the waste of human resources

22. Job Market Outlook 2009

Gyu-Hee Hwang, Ho-Young Oh, Min-Kyung Kim

The survey shows people's outlook of the job market in 2009 and how they are willing to respond to their prospect. Based on the survey, the following policy implications are brought out.

First, in increasing the public expenditure for the current economic recession, the vocational training policy must reflect the characteristics of sex and age as well as the economic activity status(employment, unemployment and unproductive labor).

Second, in expanding the employment opportunity, the previous less-attractive jobs must be reconsidered and overseas working opportunity should be constructively provided.

Third, even though it is an urgent issue to provide jobs for the workforce, policies in long term perspective need to focus more on providing prosperous jobs which could allow them to build their career into a higher level.

23. Research on Occupations in Biotechnology Industry

Dong-Son Choi, Yun-Kyoung Jeong, Na-Ra Kim

1. Introduction and Research Methods

Biotechnology industry(or Bio-industry) is defined as the technology-intensive, highly value-added industry to provide useful goods or services for human beings with applying biotechnology to DNA, protein, cell body, and so on. Biotechnology industry, together with ICT industry, has been regarded as one of core sectors for contributing to national competitiveness. Although much efforts should be made for the growth in biotechnology industry, more important is the cultivation and management of highly professional manpower. Although many research agreed that quantitatively manpower cultivated through higher educational institution is sufficient, some qualitative problems, especially problems of the gaps between school and industry, have been pointed out. In other words, the manpower that are cultivated through universities or colleges failed to meet the needs of industries in qualitative perspectives.

In this study, we tried to investigate the qualitative problems in biotechnology industry with the occupational perspectives. Specifically, our objectives of this study were not only to generate detailed occupational information in biotechnology industry, but also to produce several countermeasures for developing human resources and improving qualification systems in biotechnology sector. In order to achieve these objectives, this research made use of following methodologies: (a) reviewing the related literature, (b) interviewing and surveying scores of SME's with contents of occupational status and change, demand of human resource development, occupational outlooks, and so on, and (c) discussing our results and countermeasures with some professionals.

2. Trends and Occupational Classification in Biotechnology Industry

Biotechnology industry(or Bio-industry) is the industrial activities to make use of biotechnology as essential technological sources in the process of R&D, producing, manufacturing, and marketing. This bio-industry has several characteristics as follows: First, bio-industry makes use of biotechnology for producing goods and services. Second, the industrial activities in bio-industry include research and development with regard to biotechnology. Third, bio-industry is the sector that aims to create values with commercial uses of biotechnology. However, because the defining biotechnology industry, especially scoping the bio-industry, is considerably influenced by the definition and scope of biotechnology, several issues should be considered with regard to the scope of this study. Based upon the results of reviewing literature, the biotechnology industry in this study was defined as industrial sectors with use of modern biotechnology. In addition to this, this study tried to follow the Biotechnology Classification System of Korean Agency for Technology and Standards in scoping biotechnology industry.

Although there has been steady growth in the size of firms, market, and employees of biotechnology industry, there has been little concern with regard to occupations in biotechnology sectors. In other words, current concern has been focused upon the type of manpower, not type of occupational activities. For these reasons, the studies for identifying the characteristics of biotechnology industry with occupational perspectives have been lacking. Many research generally agreed that, although the supply of human resources is not insufficient in biotechnology sector, there are several shortages between the supply and demand with qualitative perspectives. For example, there are lacking in supplying professional human resources in cGMP(current Good Manufacturing Practices), hazard evaluation, quality management, etc. With these perspectives, the identification of occupations in bio-industry could make some contribution to occupational outlooks in biotechnology sector.

Because of the characteristics of biotechnology industry, there are some ways to understand the types and classifications of biotechnology occupations. In this study, ‘employee in biotechnology industry’ should be regarded to be conceptually different from ‘employee in biotechnology occupations’. The former is based on industry-centered approach, and the latter is based on skill-type oriented approach. Therefore, some ‘employees in occupations of

biotechnology sector' could not work for biotechnology firms because they would use their biotechnology knowledge or skills in non-biotechnology sectors. Based upon these understandings, this study defined that 'employees in essential occupations of biotechnology sector' means employees who performs relatively important roles and functions in providing goods or services in biotechnology sector. This definition does not consider the extent to which employees would make use of biotechnology in their occupational roles, because this study consider that 'employees in essential occupations of biotechnology sector' should make contribution to the innovative efforts of the biotechnology firms.

Based upon the several literatures and findings, occupations in biotechnology sector were classified into (1) research and development (including discovery research and clinical trials), (2) production and manufacture, (3) quality control and assurance, and (4) business development and marketing. With the findings of survey to 15 professionals, 12 essential occupations in biotechnology sector were selected from 42 biotechnology occupations. In this survey, respondents(SME's) were asked to rate the degree of making use of biotechnology, the degree of relative importance in R&D and production, and the degree of the growth possibilities in each occupations.

24. Development of the BARS-Based Assessment Test to Measure Core Competencies for Vocational High School Students

Dong-Yeol Park, Dong-Son Choi, Yong-Soon Lee

1. The purpose of this study

Industrial organizations are increasingly getting more and more enormous with rapid industrialization and advances in information technology, and the duties that individual should perform are diversified. For effectively coping with these environmental changes, the core competencies, which were required basically in most occupations, were more emphasized than specialized knowledge.

In this context, the objectives of this study were to re-establish the concept and dimensions of core competencies of vocational high school students, to derive main activities based on BARS(Behaviorally Anchored Rating Scale), to develop reasonable test for diagnosing core competencies, and to suggest several countermeasures for effective uses.

2. The development of BARS-Based Core Competencies Assessment Test for vocational high school students

Step 1: Define the areas of core competencies and develop behavioral anchors

For improving its validity and reliability, the BARS processes were applied to develop the test. First, this study set up the levels of core competencies and selected the related main behaviors through literature review, discussion with experts, the review on the business priorities in core competencies, and exploratory factor analysis. Through these processes, this study could identify 12 categories and 6-10 behavioral anchors in each category.

Step 2: Re-translate

194 vocational high school teachers were asked to respond the questions about the appropriateness and level of behavioral anchors. The anchors(or items) that obtained more than 60% agreement were selected as appropriate items. If any items were identified as beyond its criterion(over 60% agreement or 1.5-1.7 of its standard deviation), this study discussed its appropriateness with experts.

Step 3: Fix behavioral anchors on a scale

7 experts of the Sector Human Resource Development Councils(SHRDC) were asked to respond the questions about the levels of vocational high school students in each behavioral anchors. Based on the results of this survey, the scales(draft) of 12 core competencies were developed.

Step 4: Develop the Core Competencies Assessment Test and set up its norm

For setting up its norm, 1,040 vocational high school students and their 36 teachers were asked to answer the questionnaire for assessing core competencies of vocational high school students. The survey on 7 SHRD personnels were also conducted for identifying the competency level those businesses required. The results indicated that competencies levels which teachers evaluated were higher than the levels of businesses, except the numeracy area. This means that efforts should be strengthened for improving the numeracy competency and that the core competencies that are required for vocational high school graduates could be de-evaluated.

3. Countermeasures for effectively using of the Core Competencies Assessment Test

The BARS-based Core Competencies Assessment Test was designed to make a diagnosis of the competency levels for vocational high school students. To find the value of core competency and compare with its norm, students and teachers should fill in the form of one decimal place. And then, for interpreting the result, the value displayed on the each 12-categorized graph, which was including the level of core competency required on business field, should be presented. The standard of vocational high school

students on each 12-categorized area was placed on the last part of this paper. It is based on self-development and the students seek their directions.

25. Research of the Career Transition Support System for the Middle-aged

Ki-Hong Kim, An Im, Jung-Pyo Lee

1. Research Outline

Though many middle-aged workers are capable of working for quite a long time, they worry about the precariousness of retirement, whether voluntary or not, owing to domestic and international factors such as early retirement, high unemployment and the acceleration of the inflow of foreign workers to domestic companies due to recent FTA agreements. Meanwhile, the government is considering various political options for resolving this situation of employment precariousness so that working lives can be prolonged. In South Korea, an aging society with a low birth rate, a policy that encourages the extension & activation of the market participation of middle-aged workers is inclined toward quantitative policy accomplishment that simply creates many jobs or prolongs the employment period, a policy that is not adequate to support the employment competencies of the middle-aged.

This research, based on this necessity and reason, suggest improvement schemes to establish a government support system for efficient career transition, enabling the middle-aged to react early and prepare for the rapidly-changing labor market environment before and after retirement, while maximizing the promotion of the employment of the middle-aged. For this research project, it was established as research contents that analysis of the theoretical background & current status of career transition support for the middle-aged, as well as the Career Transition Support System(CTSS) program and the CTSS status of major developed countries would be conducted, as well as an investigation of documentary research, expert research, research for recognition & demand on career transition of the middle-aged, expert conferences and policy forums.

2. Research Result

A. Direction of the CTSS for the Middle-aged

To support the career transition of the middle-aged, the government must establish a national infrastructure for career transition support, through which the user-centered career transition support services for the middle-aged and the specific systems & programs to maximize the usage of middle-aged labor should be implemented accordingly. To establish a CTSS for the middle-aged, the government must first establish the CTSS, while companies enforce promotion schemes to support career transition, with the individual participating in self-driven career transition. The improvement solution should include support for infrastructure establishment(by complementing the law & regime, or providing various schemes to support the policy), the support system administration(by improving the management system for employment & retirement, or providing the career transition support) and individual capability improvement(by preparing lifetime career transition, or promoting the recognition of career transition), etc.

B. CTSS Plan for the Middle-aged

1) CTSS for the Middle-aged

a) Operation & Enhancement of a Dedicated Organization to Support the Career Transition of the Middle-aged

A support system must be established that can provide the middle-aged individual or the company employing the middle-aged individual with information that can support the career transition of the middle-aged. For this reason, it is necessary for the National Career Transition Support Center, dedicated to the middle-aged, that policy research of each ministry & office related to supporting career transition of the middle-aged to be carried out, along with the development of various programs and functions such as the production, collection, processing, and distribution of DB data necessary to support the career transition of the middle-aged, the establishment &

administration of local service delivery system, the premise distribution & the instruction of information & programs to support the career transition of the middle-aged, and the maintenance of a close cooperative relation with competent authorities to provide information related to career transition support for the middle-aged, etc.

b) Network Establishment to Support Career Transition of the Middle-aged

To efficiently administrate the CTSS for the middle-aged, a policy linkage must be implemented between related ministries & offices while the integrated network is established. In addition, network cooperation(by the unit as centralized authority, city & province, district) must be organized to promote the importance of schemes to support career transition of the middle-aged, as a background to the one-stop CTSS service. In addition, systematic schemes, such as the development of specialized programs for career transition support, reciprocal connection between education & training programs of the public/private sector, and consulting programs for career transition support, etc., are necessary.

2) Areas of Improvement to Support Career Transition

a) Areas of Improvement at the National Level

Areas of improvement at the national level to support career transition of the middle-aged include legal, administrative, and financial support for the organization & administration of the National Career Transition Support Center, the expansion of laws related to career transition support for the middle-aged, the development of a standard manual, the promotion of retirement age prolongation, linkage of the Lifetime Learning Credit System and Job Capability Development Credit System, the arrangement of a professional education & training system, support for the company & the middle-aged and the promotion of social recognition.

b) Areas of Improvement at the Corporate Level

Areas of improvement at the corporate level to support the career transition

of the middle-aged include CTSS establishment and competent center administration by the company, implementing step-by-step lifelong CTSS, developing a career transition program adequate for the needs of companies, and the propagation of a wage peak system for the assurance & delay of retirement age.

c) Areas of Improvement for Individuals

To support career transition of the middle-aged, the individuals must promote the recognition of career transition while reinforcing their capacities for transition to new careers.

C. Propose

The government must recognize career transition support for the middle-aged as an absolutely necessary investment for cost saving in the social welfare sector in the future, by establishing a short & long term policy vision, step-by-step implementation program and a financial support plan to support career transition of the middle-aged. In addition, the government must maintain consistency and continuance in the policy of the CTSS for the middle-aged, by inspecting the policy promotion process and analyzing the effects of the policy. In addition, a social consensus must prevail that the support of the government & companies is necessary for the career transition of middle-aged individuals.

26. A Study on Career Path of Vocational High School Students

Sang-Joon Lee, Na-Ra Kim,
Yeo-In Yoon, Jae-Sung Ko

The main theme of this study is to examine effects of 'school-to-work', or 'work-to-school' between vocational high school students and general high school students. To earn proper result, we analyzed 'major match', 'career development in vocational high school', 'effect of entering a school of higher grade' and etc. We adopted IV estimation, D-D analysis, LISREL, and PROBIT for this research.

27. A Study on the Distance Education of Vocational Training for Foreign Workers in Korea

Sook-Young Lee, Sook-Young Byun,
Myung-Hee Jang, Hyun-Ju Jeung

1. Overview

The purpose of this study is to suggest measures and strategies to help facilitate distance education training system which is considered to support the vocational skill training for foreign workers.

For this purpose, literature review was employed to explore the meanings, roles, and definitions of vocational skills training system for foreign workers, which leads to draw the policy implications toward distance education training. Survey and interview were also conducted (a) to examine the current situation of vocational skill training situations for foreign workers and (b) to analyze the needs of foreign workers and employers in pre-job training, job training, and post-job training. Finally, an expert panel was made to confirm the validity of research direction and methodology and to draw the suggestions for the utilization of distance training for foreign workers.

Through this process, the strategies for further development of distance training for foreign workers are proposed as the study conclusions.

2. Analysis on actual situation of vocational skill training institutions

For the purpose of looking into the actual situation of vocational skill training institutions for foreign workers, a survey questionnaire was administrated to (a) eleven nations whose citizens come to work, (b) five employment training institutions, and (c) three foreign workers' centers. A 100% respondence rate was shown in the survey. Findings of the survey are summarized as follows:

A. It is shown that many training institutions for foreign workers have attempted to develop a variety of learning media and to apply distance training program to pre-job training, job training, and post-job training. This current situation is assumed to validate the necessity of distance education training for foreign workers' vocational competency.
B. The remaining actual situations reveal the necessity of distance education training.

- Foreign workers, as learners, need the learning environment where they can access to materials and support anytime and anyplace at their convenience.
- Foreign workers are asked to spend time on learning languages and comprehending cultures continuously and repeatedly, not in the short term.
- Appropriate instructors for foreign workers' employment training are not easily recruited in the off-line field.
- Foreign workers need individualized and customized learning environment because they have different nationality, characteristics, needs, and levels.

3. Analysis on the needs of foreign workers and employers

For the purpose of analyzing the needs of foreign workers and employers about vocational skills training, a survey was carried out. Particularly, foreign workers' respondents were separated into two groups; (a) employment trainee and (b) trainee in foreign workers supporting center. First, employment trainee were mandatorily responded to the survey when the whole courses were completed. The survey for the second respondent group was administrated to three foreign workers centers which have been supported by the Ministry of Labor; Korea Migrants' Center, ANSAN Foreign Workers Center, and Uijeongbu Foreign-workers Center. Both surveys were performed from September 26, 2008 through October 10, 2008.

Analysis of the survey on the needs of foreign workers and employers about vocational skills training reveals the following suggestions.

First, it is necessary to provide standardized instruction manual and to train instructors in order to narrow the gap in education quality, especially shown in the pre-job training field.

Second, a diversity of efforts should be made to guarantee the connection

among pre-job training, job training, and post-job training.

Third, it is advised to introduce and utilize distance training which allows the convenience of time and place in learning environment.

Fourth, computer-related facilities and education should be provided to foster distance education training.

4. Suggestions for the utilizations of distance training for foreign workers

A. Vocational skills training system for foreign workers

The vocational skills training system for foreign workers is fundamentally related to a policy for the introduction of foreign labor force. Therefore, the objectives, functions, and types of vocational skills training system should be examined and developed in accordance with the change of a policy on foreign labor force. The transformation from Industrial Trainees System to Employment Permit System for Foreign Workers accompanies not only the change of labor market and employment policy but also the change of the functions and roles of vocational skills training system. The introduction of Employment Permit System for Foreign Workers also defines foreign workers as employed-workers, not industrial trainees, meaning that employer's voluntary options can be guaranteed. Based on this systematic change, the roles, functions, and operations of vocational skills training system should be changed as follows:

1) It is imperative to establish vocational skills training system in line with Employment Permit System for Foreign Workers. In other words, 'advanced(upgrading) courses' for employed workers should be highlighted, instead of 'basic(nurturing) training courses' for industrial trainees(would-be employed workers).

2) Importance of preliminary education about nations whose citizens come to work should be more emphasized.

3) It is necessary to set up an organic corporation system among pre-job training, job training, and post-job training.

4) In case of post-job training, the role of 'education' should be strengthened.

B. Utilization of distance training for foreign workers' vocational skills training

A variety of politic attempts can be made to improve the vocational skills training system for foreign workers. Among those efforts, the introduction and practical application of distance training are expected to help realize and facilitate the connection, standardization, and sharing of the vocational skills training system for foreign workers.

On the side of foreign workers and employers, distance learning can offer learners easier access to materials and support anytime and anyplace at their convenience; /learners can access information as needed, and new skills can be applied immediately, thus reducing delays and lost productivity. On the plus side, distance training ensures learner-centered(customized) learning environment. Therefore, distance training can promise substantial benefits for employers and foreign workers in terms of education efficiency. More practical suggestions for the direction to utilize distance training are shown as follows:

First, the connection, standardization, and sharing of the vocational skills training systems should be strengthened by utilizing the distance training.

Second, it is imperative to spread equal education opportunity for foreign workers by utilizing the distance training.

C. Policy on distance education training for foreign workers

Based on the demand of infra establishment, this study suggests following policies and strategies for introduction and utilization of distance education training for foreign workers' vocational skill training.

1) Policy on infra for distance education training

- to provide computer-related facilities for easy access to internet and telecommunication technology
- to establish the system managed by government departments for standardization, connection, and sharing
- to establish the roles and functions of distance training-related institutions

- to encourage distance training institutions' interests and participations in foreign workers education training.

2) Policy on implementation for distance education training

- to construct and run a portal site for foreign workers' vocational skill development
- to develop online teaching materials and media
- to open and operate the distance training courses
- to establish the educational courses for Blended Learning and Mobile-Based Learning

28. OECD Vocational Education and Training International Comparison(Ⅱ)

Eun-Sang Cho, Su-Weon Kim, Jun-Pil Ok

This research dealt with a variety of different subjects such as, the system of VET, VET program, labor market, social parter mechanism, finance and etc., to help OECD VET team research on "Learning for Jobs: the OECD policy review of vocational education and training." In order to answer the very comprehensive and difficult questions regarding VET questions in Korea, researchers reviewed literature, held expert committee, and implemented fact-finding and main visit by OECD VET team. Through this process, the voices were collected and reflected in the policy recommendations of OECD.

Recommendation 1: Stronger industry involvement in decision making over VET

Create an institutional framework(e.g. permanent bodies at sectoral/regional/ national level) which allows employers and trade unions to be represented and systematically consulted on issues related to VET(including curriculum, qualifications, work placements, definition of VET provision etc.). In addition, all interested ministries(Ministry of Education, Ministry of labor, and others) should be involved.

Comments on Recommendation 1: The general direction of this recommendation is correct. However, as to employer participation, more concrete methods for implementation such as guidelines for providing incentives for corporations are needed.

Recommendation 2: Development of good quality workplace training

Encourage initiatives(including local innovations) of partnership between VET institutions and firms leading to good quality workplace training, support and promote successful examples as 'best practice'. General standards should be

developed on the content, organization and oversight of workplace training(e.g. how the training should be conducted). They should be developed in cooperation with industry. (e.g. in some countries general occupational competencies to be acquired by students, and requirements for VET trainers are specified)

Comments on Recommendation 2: It is necessary to invite employer's participation by providing the employers with incentives so that good quality workplace training can be implemented in a more effective way.

Recommendation 3: Improving skills of VET teachers

Encourage potential candidates to the teaching profession to have relevant work experience prior to entering the job, that is especially lacking in upper sec VET.

Require all VET institutions to ensure that VET teachers regularly update their skills in the vocational area(and acquire knowledge of prevailing technology and practice in firms).

Comments on Recommendation 3: It is important to emphasize and develop continuously the on-site practical capacity of VET teachers for the successful implementation of VET.

Recommendation 4: Qualifications and assessment procedures

We recommend aligning of graduation degrees and licensing exams. This could be done by creating a single qualifications framework − linked to VET institutions − with competence-based exit assessments carried out with the involvement of employers. The requirements of such assessments would be reflected in the curricula of VET institutions.

Comments on Recommendation 4: In case of formal educational institution, it is difficult to align graduation degree with certification tests because general curriculum as well as vocational curriculum for certification are included. However, as for the vocational training institutions, some vocational high schools, and some departments/special programs of community colleges, it is possible to apply industry(employer and unions)-initiated national skills standards and VET curriculum so that the current VET curriculum and certification tests can be adapted to the on-site practices.

29. Development of KRIVET Occupation Prospect Index(2008)

Yun-Kyoung Jeong, Sang-Geun Han, Ho-Young Oh,
Hea-Jung Chang, Na-Ra Kim

1. Introduction

This study succeeds the 2007 project on "Development of KRIVET Occupation Prospect Index." The main objective of the 2007 study was to complete the development of the Occupation Prospect Index of 152 jobs from manufacturing and construction industries. In addition to last year's survey, we have carried out a survey on 165 jobs from management occupations, business and financial operations occupations, social service occupations, sales, personal care and service occupations, farming, fishing, and forestry occupations in this year. The purpose of this study is to afford a credible Occupation Prospect Index of 317 jobs in all occupations synthetically and make it public so as to broaden the understanding of individuals about the world of occupations and thereby support rational career planning. Also, it aims to strengthen the linkage between school and work, and to support the government's HRD policy.

KRIVET Occupation Prospect Index consists of seven evaluation areas and 23 detailed items as follows: ① compensation - earnings and benefits ② employment conditions - job creation, job growth, and job competition ③ employment stability - full-time employment and job retention ④ career growth prospects - self-development, promotion, and possibility of job change ⑤ working conditions - working hours, physical environment, stress ⑥ professionalism - expert knowledge, autonomy, authority, social reputation, community service, and spirit of calling ⑦ employment equality - gender equality, elder-friendliness.

First of all, we have constructed a database of 17,517 occupation experts using various ways and developed an on-line survey system. Survey period was from May 9th to June 20th, 2008. We received 4,950 responses from

1,082 occupation experts of 165 occupations surveyed this year. They responded to these items for maximum of 10 jobs among 165 jobs which were from management occupations, business and financial operations occupations, social service occupations, sales, personal care and service occupations, farming, fishing, and forestry occupations. They have evaluated 23 detailed items for each job of their choice for present and 10 years later from now.

2. Main Findings

The Occupation Prospect Index(2008) was compiled for the 317 jobs based on occupation experts' responses on 23 detailed survey items. The main results will be presented in three distinguishing time horizons, namely, present, 10 years time, and the difference between the two points in time.

First, according to the Occupation Prospect Index(2008) for the present, business and financial operations occupations showed the highest prospects, followed by management occupations, social service occupations in KECO major group. As looking into the comprehensive Occupation Prospect Index in KECO minor group, finance and insurance related occupations showed the highest prospects, followed by law · police · correction related occupations, IT related occupations, management occupations, and business · finance office work related occupations.

Second, according to the Occupation Prospect Index(2008) for the 10 years time, the occupations with the highest prospects are business and financial operations ones, followed by management occupations and social service occupations in KECO major group. As looking into the comprehensive Occupation Prospect Index(2008) in KECO minor group, finance and insurance related occupations showed the highest prospects, followed by food service related occupations, business · finance · office work related occupations, management occupations, and food processing related occupations.

Third, the analysis of the change in Occupation Prospect Index(2008) for 10 years time showed a significant structural change in the world of occupations. Occupation Prospect Index for present and 10 years later from now had a high correlation. This means that the structure in the world of occupations for present will be kept for 10 years from now.

Prospective occupations of both now and in the future included business ·

finance · office work related occupations(experts in human resource and industrial relations, management consultants, etc.), finance and insurance related occupations(investment and credit analyst, financial consultant and fund manager, etc), health and medical service related occupations(doctor, oriental doctor, etc), and engineers in various fields(mechanical/materials /chemical/electronic engineering).

Occupations with weakening occupation prospects of both now and in the future included construction related occupations, such as steel worker, concrete worker, cement masons and concrete finisher, brickmason, plasterer, paperhanger, coal miner, stonemason, construction and mining related worker, driving and transportation related occupations, business and sales related occupations, guard and cleaning related occupations, sewing machine operator, flour milling and polishing related occupations, production worker, packer and packager, farming, fishing, and forestry related occupations(agricultural crop cultivator, fisher and woman diver).

3. Policy Implications

Policy implications of the above analysis are as follows.

First, it is necessary to raise a recognition about engineers and craftsmen and strengthen career education.

Second, it is important to raise a recognition about financial operation, management and social service occupations and cultivate professional manpower in those areas.

Third, more various occupations will be good occupations for each occupation prospect area in the future occupational world. Therefore, it is necessary to strengthen career education that adolescents could form the flexible occupational view.

Fourth, it is required that many jobs will increase to utilize the idle labor force. In order to utilize the female labor force and middle and old people, it is very important to offer them suitable jobs. In addition, to improve working conditions of the small and medium-sized enterprises, government should provide policy countermeasure.

Fifth, it is necessary to prepare the demand-supply alternatives of teachers considering the aging society prospect.

30. National Human Resources Development Policies and Strategies under New Government System

Mi-Sug Jin, Kyeong-Jong Kang, Il-Gyu Kang,
Nam-Chul Lee, Yu-Mi Son, Jae-Seek Jeon,
Mi-Ran Kim, Chang-Yong Song, Ho-Young Oh,
Yang-Gyeong Sung

Human Resources Development(HRD) policies are very important tools for strengthening national competitiveness in general, Korea in particular. In Korea which does not possess rich natural resources such as oil, the human resources with high quality is the most important factor to bring about economic growth. And thus, HRD policies to produce high quality HR and to utilize HR effectively must be dealt with as one of the most important national agendas.

In this study, in order to support the new government, we tried to analyze the change of external environment surrounding national HRD policies, to set up new paradigm for HRD, and to draw core policies and strategies for the new HRD system. We proposed a new paradigm for NHRD, which focuses on the reform of learning curve from 'learning for college entrance' to 'life-long learning'. As HRD policy direction to support 'Lifelong Learning Curve', we proposed life-stage approach, globalization, and indirect support through building infrastructure such as statistics and DB system.

As HRD strategies, we suggested 1) innovation of elementary and secondary education to strengthen creative learning and core competence, 2) strengthening the global competitiveness of higher education, 3) utilization of army service period to increase the quality of human resources of the youth, 4) increasing the accessibility of adult learning, 5) building global Korean HR network and global outsourcing of the highly skilled, 6) building regional human resources development system to contribute regional development, 7) systematic manpower prediction, 8) making globally applicable Korean qualification system, 9) strengthening HR policy evaluation system, etc.

In addition, in this study, as urgent HR strategies to be pursued in short time period, we suggested following issues;

1) the formula funding financing system of higher education which is based on objective and reasonable indicator to support higher education
2) individual lifelong learning account system
3) HR strategies for knowledge-based service industry
4) diagnosis system of core competences of college students
5) innovation of national R&D system
6) qualitative approach for manpower demand prediction
7) HR strategies to strengthen South-North Korean collaboration
8) new governance system for national HRD policies

31. A Basic Study of Enhancing In-Plant Lifelong Learning Competency

Jung-Taik Lee

1. Issue Statement

The study aimed at designing an in-plant lifelong learning competency building up framework and suggesting policy alternatives for deploying the designed framework into small and medium enterprises in Korea(SME). In the process of drawing relevant framework elements, previous research done by the researcher and the five case studies including L Group Training Center, H Paper Co., LTD, S bank, and M global company were reviewed.

The task of designing the in-house lifelong learning competency framework required systematic linkage between the traditional instructional system design elements and self-directed learning principles as well as application of workplace practices observed from study of the four cases into the designed framework. The work of deploying the framework into Korean SMEs cannot be feasible without provision of government support programs since market principle doesn't work efficiently in the areas of SME learning competency building. Thus, tasks of designing and deploying need systematic interconnection between theory and practice, on the one hand, while they require Korean government facilitating and incentive supports, on the other one.

The study faced the dilemma discussed above. Solution of it was beyond the capacity and the scope of this study, however.

2. Theoretical Background

Research results completed by the researcher during the past couple of years say that lifelong learning world covers not only systems in lifelong education, but also formal, informal, and nonformal learning activities implemented on an

ongoing basis. (the Cologne European Council. June, 1999) All the relevant domains became the theoretical background. At the same time, literature review in those fields helped the researcher to reaffirm the definition of in-plant lifelong learning; to summarize the scope of lifelong learning competency; to build up the framework principle, development procedures and methods of lifelong learning program.

Based on the above, concept of in-plant lifelong learning competency enhancement was defined vis-a-vis clarification of learning organization construction competency, lifelong learning tool utilization competency, and corporate output enhancing competency thanks to efficient in-house lifelong learning. In connection with the above, rationale of the competency enhancement was justified and governing principles were suggested theoretically. Scopes as well as targeted actor focused competency was developed.

3. Contents of the Study

Program run cycle of the in-plant lifelong learning process shows the circular relationship structure from the phase of learning readiness into that of the assessment. It is a comprehensive circular system where all the elements work together. For enhancement of high functionality, diagnosis of the early phase elements including learning readiness and learning needs is critical since assurance of functional interplay by those early elements guarantees smooth lifelong learning goal setting, the results of which predict efficient monitoring and time saving for the system run as a whole.

The study suggests five in-plant lifelong competency building up frameworks described below:

Firstly, in-plant lifelong learning readiness diagnosing competency framework was shown. Learning preferences, self-check competency of in-plant lifelong learning, and learners' preferred learning style were diagrammed and discussed.

Secondly, in-plant lifelong learning need assessment guide was set up in a different way from how learner's perceived organizational need assessment is designed.

Thirdly, in-plant lifelong learning goals was set and human and material resources were identified in such a way in which these works can function as an aid to prioritize the set goals, to account for the goals set, and to select and

utilize the resources.

Fourthly, practical ways for selection and execution of learning strategies were suggested so that they can help undertake learning contract, set evaluation criteria and utilize useful in-plant lifelong learning tools.

Fifthly, evaluation guide was shown with indication of the ways in which evaluation outcomes and criteria are compared and feedback is activated.

Detailed work of suggestions mentioned above was done theoretically and practically. As emphasized by this study, the task of building up in-plant lifelong learning competency at SMEs in Korea is critical and of high value. In this vein, description of the four case studies discussed below is of significance, given the detailed in-plant lifelong learning competency guide.

4. Case Studies

Four cases were selected as ones representing big conglomerates, manufacturers, banks, and global divisions, respectively. They are LG Training Center(L Group Center), Hansol Paper manufacturing(H Paper), Shinhan Bank(S Bank), and Sun Microsystems(M Global).

L Group Center, called Human Resource University, shows excellence in corporate learning. System, execution, learner performance, evaluation, and all others are well developed. Core competency drawn from the Group's key philosophy, JeongDo management is cultivated, based on which target-based competency driven training is deployed.

H Paper emphasizes performance and changes innovations in delivering competency building up training activities. It has its own department dealing with the tasks. Level-, target-, domain-specific programs are designed and executed. S Bank emphasizes more volunteerism. Evaluation of employees' performance is strict, too. M Global adopts system and program execution designed by its headquarter in USA.

L, H, and S are originated in Korea while M is in USA. In general, qualification levels in the four remains the same except one thing. M undertakes better than the other three in ensuring seamless convergence among the five phases, learning preference identification, needs analysis, goal setting, strategy selection and execution, and evaluation and feed back.

5. Significance and Policy Suggestions

Significance of this study lies in that value of SME lifelong learning competency enhancement should be prioritized by Korean government. SMEs are reluctant in initiating the task not because management is ignorant of the importance. Human resource shortage as well as high mobility of capable workforces is the main cause. Government should provide incentives. SMEs will begin to be kin to value of in-house learning competency cultivation. It takes time. Enhancement of in-plant lifelong learning competency across the country takes time and investment, but it is of significance as long as Korea wants to upgrade SME competitiveness through in-plant lifelong learning at SMEs.

Detailed action plan should be designed by Prime Minister's Office. It should be Minister-specific one. Incentives must be tailor-made. Guideline needs to be specified but practical. Assessment of all performance should be strict but flexible execution is required since facilitation is not to be discouraged.

Cooperation among SMEs, government, R&D including universities, and communities is most critical. Input to the government initiatives and feedback from the stake holders should be utilized as key resources. SMEs should take initiatives in securing exemplar cases of increasing corporate output thanks to the corporate learning. They should be developed into the form of contents for promotion.

32. Institutional and Policy Reforms for Educational Advancement

Yong-Hwan Lee, Do-Chul Shin, In-Jae Lee,
Young-Key Cho, Chang-Won Jang

This study examines the institutional and policy reforms that have already begun to improve the efficiency and fairness of education system in Korea, and future reforms that will strengthen the education even further. The underlying premise is that two fundamental elements - market discipline and sound institutional infrastructure - must be strengthened in order to ensure greater educational advancement and offer the best and most competitive education opportunities for the next generation.

The study consists of four themes: Part I, Institutional and Legal Reform Agenda for Education Advancement; Part II, Policy Challenges for Improving Secondary Education; Part III, Reforms for Enhancing the Performance of the Tertiary Education System; and Part IV, Restructuring Lifelong Education System.

Each part of this study analyses the significance of the issue under discussion, the major points of contention, and the likely results of institutional and policy reforms, with further suggestions on how the issue may be settled.

33. Educational Globalization Strategies of UAE

Tae-Joune Park, Yu-Mi Son,
Han-Byul Kim

This research is related with the Global HR Forum 2008-Regional Conference in Dubai conducted by KRIVET, The Korea Economic Daily and Ministry of Education, Science and Technology.

In this research, we introduced the Dubai Model, which has grown as a 'center of the world' by producing a big project such as Internet City, Media City and Knowledge Village in Dubai, and the Abu Dhabi Model, which has started the business that focuses on Culture and Education after established the board of 'Abu Dhabi tourism' on fall of 2004. In addition, we were looking for implications from the UAE's educational globalization and knowledge management strategies by examining and comparing the Dubai Education Model and Abu Dhabi Education Model.

The method of the study was the 'situational comparative analysis.' Through this method, we found a lot of characteristics of Dubai and Abu Dhabi's educational globalization and knowledge management strategies. The findings of the study are summarized as follows.

First, Dubai adopts the strategies that industrialize all the educational resources as much as available; on the other hand, Abu Dhabi adopts anti-industrialization of education and cultural development strategies. Second, Dubai gives priority to educational industrialization, economic development, market-based knowledge society, foreign capital, market while Abu Dhabi gives priority to anti-educational industrialization, Cultural development, ethnocentrism, cultural knowledge development, domestic capital, governmental regulation. Finally, Dubai adopts industry-oriented higher educational system; on the other hand, Abu Dhabi adopts culture-oriented higher educational system.

34. National Strategies for Job Creation

Chang-Kyun Chae, Ahn-Kook Kim, Young-Sup Choi,
Ho-Young Oh, Jae-Ho Jeong, Yeo-In Yoon

These days, job creation is becoming a pending agenda at a national level. At such situation, this research suggested contents and directions for national strategies for job creation, and intended to find solutions that were very specific and practical for job creation. We assumed that the core principle of national strategies for job creation is to make more high quality jobs. Through the comparison with developed countries, we explored the jobs that could be created, particularly, the high quality jobs. Then we studied how we could make more jobs in that field. The purpose of this research was to find more practical alternatives.

This research suggested practical policy alternative plans in 9 fields for job creation. At first, in this research, creating job through regulation abolition and foreign capital flow was analyzed. We have investigated the propulsion of regulation effect analysis, sustainable propulsion of economic freedom zone, creation of high quality job, and increasing support for foreign enterprises.

Second, this research discussed the overseas employment expansion of youths and the elderly. Through the analysis of existing policy and developed countries' example, we came to know that it is very effective to make more volunteer groups and cooperation teams in case of need at the level of youths. Then for the elderly, at first, it is important to procure professional group and then connect them with developing countries' demand.

Third, we suggested short-time job revitalization methods for promoting participation of women's labor market. There were effectiveness guarantee of proportional protection and discrimination prevention, expanding investment for care center for children, improvement of temporary leave for child care, introduction of short-time work system, offering some incentives to companies which introduced 'short-time work system for regular job', operation of flexible work time system in the social-service field, and attempting to job sharing of

regular full-time employee through work time reduction.

Fourth, to make more jobs in the level of small and medium enterprises, it is needed to make good quality commencement of enterprise, to strengthen competitive power of existing enterprise, to ease miss-match in demand and supply for manpower, and to reexamine support standard of small and medium enterprises, etc.

Fifth, this research pointed out that if we had wanted to be revitalized in technical commencement of enterprise for job creation, it could be a way to amplify infrastructure such as networks and information service for the founder, to enlarge spin-off support system in university or research institute, to build incentive system for the individual founder, and to make a consulting system for technical commencement of enterprise, etc.

Sixth, to make more jobs, this research suggests that there is a need to make a renovation between labor and management, more specifically, it's needed to share management information and to revitalize common education and training program between labor and management, to convert into ability development-friendly wage system, and to promote common business of both labor and management for employment and human resource development.

Seventh, this research described the augmentation need of social-public service and speciality of social-pubic sector job. In relation to social-public service delivery, we researched the possibility and limit of job creation in this field.

Eighth, to create jobs in the financial industry, we suggested improvement of regulation, construction of world-class security infra, building up the foundation for global players, revitalization of education and training for financial human resource and, supply with high and mid-level manpower in the money market.

Finally, we pointed out development of initiative and enterpriser competency, fostering cultural industry professional enterprise, and promotion of technical competency of cultural contents. Then, we looked into the practical policy alternative plans.

35. Skill Formation and Wage System: Case Studies on Volkswagen, Toyota and Hyundai

Sung-Gug Jung, Hyung-Je Jo,
Sang-Hak Lee, Ahn-Kook Kim

This study is concerned with the relationships between the skill formation and wage system. The objects studied are Volkswagen, Toyota and Hyundai. The analysis results are as follows:

〈Volkswagen〉

The development of Volkswagen's production system from the 1950s to the recent period can be interpreted as a transition from Taylorism-Fordism to a flexible production. As the production system changed in that way, the technology, job structure and work organization were revised as well, and the labor relation issue which had to be resolved was the wage system. The new wage system was created in 1980, one which would considerably influence the future direction of work organization at Volkswagen. The old system of wage differentiation, introduced in 1951, was based on an analytical scheme of job evaluation. Even slight changes of work organization and any new job assignment affected pay under this wage system. The new wage formula abolished the system of evaluating individual jobs on the basis of new job systems.

But the new wage system of Volkswagen was also a job based one. It had marks of Taylorism-Fordism. Although Volkswagen has tried to revise its wage system to correspond to the requirement of flexible production, the job based wage system contradicts it. Especially the problem-solving and social-communicative competency which have more importance in a flexible production can not easily be the object of job evaluation. But until now the managers and trade union did not consider a competency as unit of wage system. The trade union is afraid of the possibility that it might lead to the breakdown of industry-level qualification structure for workers' solidarity, and for managers, it means the raise of wage cost.

〈Toyota〉

Toyota Production System(TPS), the crucial part of Toyota company, is composed of three factors, 'ability to product', 'ability to 'Kaizen'', and 'ability to evolve' which makes other competing companies hard to imitate or follow. We can assume that the core factor of TPS is an ability to enhance the factory operation. In addition, the mechanism coupled with skill-formation and succession system leads Toyota to bring about outstanding outcomes.

The notion of Toyota's 'skill' focuses on the ability to cope with abnormal situations, and to organize the ability as a whole which acquire not only professional knowledge but also sociality and responsibility. Toyota invests in education and training programs in order to support the skill-system. Along with OJT, the company operates over 80 training facilities, including a large scale of training center such as GPC for factories located in foreign countries. Toyota also allocates entry-level employees to participate in various programs such as skill-advancement, acquiring expertise grades, and skill-exchange association which accelerate training and education.

In order to encourage employees to participate in skill-formation and training programs actively, Toyota runs a competitive promotion-system coupled with qualification. In this system, employees show their ability and active attitude to get promoted and higher payments. Therefore, it can be concluded that payments based on the job evaluation preserves Toyota's skill-system. Toyota's system with acquiring expertise which focuses on the promotion of entire employee shows the company's effort to guarantee a better pay. Nonetheless, according to the fact that the wage structure is bond with individual performances, it is obvious that the system is highly competitive. Based on the fact that the Toyota's personnel system is mainly focused on the development of organization and not on the individual's quality of life, the recent advent of a democratic labor union seems inevitable.

The mechanism which matches up the human side and technology side factors under the unequal situation in industrial relations makes TPS exceptional. Korean car industry should focus on building well balanced industrial relations, which can be harmonized with an organizational skill-formation system. Labor movements also should consider and accept the way to reward high performer properly, which will guarantee steady employment and high income.

〈Hyundai〉

This chapter purposes to explain the characteristics of Hyundai production system in terms of 'systemic rationalization' theory. Hyundai Motor Company has developed the trend of 'systemic rationalization' for the production system, as it has introduced and digested foreign technology under the circumstances of Korean economy. From the point of 'systemic rationalization' theory, the relative importance of direct labor has decreased, as 'systemic rationalization' of Hyundai Motor Company has been advanced. As the 'systemic rationalization' has been developed, skill formation of laborers has been degraded into marginal position. Nevertheless, skill formation itself has its own significance in the Hyundai Motor Company.

The outline of this chapter is as follows. First, Hyundai Motor Company has heavily depended on the active role of senior laborers and specialists, while the ability of most laborers has been underdeveloped. However, the skill level of senior laborers and specialists has not been evaluated as such high level that they expected it should be.

Second, the skill formation system of Hyundai Motor Company has not been properly functioned, because the employer and the employee did not feel the necessity of education and training for the employees under the confrontational labor relations. After the introduction of verification system, vocational ability has been discarded during the 1990s, and the relative importance of education and training has been decreased.

Third, the wage system of Hyundai Motor Company has nothing to do with the skill formation of employee, because it has been based on the seniority of employee. However, the wage system based on the seniority can not be regarded as rational in terms of systemic rationalization theory. While the seniority has nothing to do with the skill formation, the wage level has been kept increasing.

Fourth, Hyundai Motor Company with the existing Hyundai production system has fulfilled its competitive advantage by developing and producing the small number of the cheap priced model. However, in order to survive the environmental change in the future, Hyundai Motor Company has to establish new Hyundai production system that can flexibly respond to the change of consumer demand. New Hyundai production system includes the skill formation system based on the wage system to support the improvement of skill level of laborers.

36. An Analysis of Employment Status for Graduates of Higher Education upon Initial Entry into Labor Market

Jin-Ho Yoon, Ki-Gon Nam,
Si-Kyoon Lee, Ho-Young Oh

This paper examines the performance of graduates of higher education in the labor market from various angles, with an aim of finding out potential problems they face while seeking to gain a foothold in the market and analyzing how universities and governments abroad are striving to address these problems. This paper consists of six chapters, whose outlines can be summarized as follows:

Analyzed in Chapter 2 is the time-series trend in the performance of college graduates(i.e. those graduating from four-year universities or two-year colleges) in the labor market. Using the raw data from the Survey on Economically-Active Population, the labor-market performance of those graduating from four-year universities and two-year colleges in the same year is tracked by year and month. In the case of graduates from four-year universities, even when the personal properties of individuals(e.g. sex, age and marital status) are kept under control, the employment rate is lower for more recent graduates while the unemployment rate remains constant. This implies that the economically-inactive population among such graduates is growing in size. When it comes to graduates from two-year colleges, in contrast, the aforementioned trend of falling employment rate is not found. As for the ratio of professionals against full-time workers in those having landed a job, this ratio tends to increase clearly for more recent graduates from two-year colleges, while the tendency is relatively weaker for four-year university graduates.

In Chapter 3, the GOMS data from the Korea Employment Information Service(KEIS) is utilized to find out how the graduates' activities back at college affect their performance in the labor market. The analysis indicates that for all graduates surveyed, their graduation GPAs were significantly

related to their performance in the labor market and that the overseas study experience of four-year university graduates has significantly positive impacts on their labor-market performance. Other factors significantly influencing the hourly wages of four-year university graduates include: changing of one's major; completion of double(or second/interdisciplinary) major; and annual costs of private education(i.e. taking courses in private institutes). It remains to be seen, however, if such variables do improve their human capital and productivity and thereby their performance in the labor market. The level of wage premium regarding overseas study experience is the highest in workplaces where foreign languages are not utilized; graduation GPA brings about the highest wage premium in workplaces that are totally irrelevant to their majors at college. This demonstrates that variables related to graduates' activities back at college, such as graduation GPA and overseas study experience, are more likely to serve as a signal of their excellence to their employers than to enhance their human capital for themselves.

Chapter 4 identifies the impacts of post-graduation experiences on the graduates' employment as well as quality of employment; the data used here is KEIS Youth Panel for Years 1-6. Graduates' chance to be employed is not significantly affected by the extended period of unemployment; the period of unemployment does not particularly influence the probability of their being employed as irregular workers or by small businesses employing less than 30. As for the impacts of job-seeking endeavors(e.g. vocational training experience and license acquisition) on the probability and quality of employment, acquisition of licenses enhances the probability of employment but vocational training experience does not. Also, vocational training experience and license acquisition do not have any significant impacts on the probability of being employed as irregular workers or by small businesses employing less than 30. For those landing their very first jobs as irregular workers, this does not significantly affect their chance of future employment, but their future jobs are more likely to be irregular ones. College graduates landing their first jobs in small businesses employing 30 or less have a lower chance of future employment as well as the probability of their being employed by other small businesses employing less than 30 in the future. This empirical analysis shows that, when young, educated men and women make their way into the labor market, their period of unemployment does not directly influence their chance to be employed but their choice of the very first jobs does have

significant impacts on their future career.

In Chapter 5, the examples of the United States, the United Kingdom, Germany, France and Japan are examined to find out how advanced countries have dealt with the entry of graduates from higher education into the labor market and formulated relevant policies. Since the 1990s, most advanced countries have experienced a sluggish growth in market demand for graduates of higher education as well as a dramatic increase in their number, though this tendency has varied slightly by country. As a result, it has not been easy for these graduates of higher education to make foray into the labor market. To address issues related to the graduates' entry into the labor market, these advanced countries have introduced a wide variety of policies that can be broadly divided into the following three: First, higher education providers in advanced countries have generally reinforced career education for their students(e.g. opening courses on business and professional life; providing various training sessions for enhancing students' employability; and spreading the so-called "dualized" education combining learning and on-the-job experience). Second, they have strengthened their career guidance services for students and graduates(e.g. offering career guidance/counseling; providing job information; holding a variety of aptitude tests; offering internships and other related opportunities for students; and helping students get a job). Third, with the issue of youth unemployment emerging as a serious social issue in advanced countries, a wide array of youth employment promotion policies has been put in place. These policies have become increasingly systematic(e.g. New Deal Program and Connection Service of the United Kingdom; and "Youth Self-Reliance and Challenge Plan" of Japan), comprehensive(e.g. One-Stop Career Center of the United States; and Job Café of Japan), and customized to the individual needs of job seekers.

Lastly, Chapter 6 suggests policy alternatives from the above empirical research and case studies on advanced countries, which can be summarized as below: First, more systematic and comprehensive measures need to be devised to respond effectively to the growingly universal coverage of higher education and changes in market demand for graduates of higher education. Second, the overall curricula for higher education should be overhauled to help the graduates enter the labor market more easily and pursue better career options. (In other words, a new, Korean-style dualized education system needs to be adopted.) Third, colleges and universities need to greatly enhance their

career-supporting functions. Fourth, wide-ranging youth employment promotion policies should be incorporated into a more systematic, comprehensive and customized policy scheme. The focus of youth employment promotion plans should be shifted from merely creating more jobs on a short-term basis to facilitating the entry of college graduates into the labor market.

37. Activating Participation of Labor and Management in Regional Labor Market: Focused on the Capacity Building of Labor & Management

Ho-Chang Lee, Dong Park,
Dong-Gyun Han, Tae-Hyun Uh

This study addresses the participation of labor and management in regional labor market and explores the capacity building measures for labor and management at regional level. For an empirical investigation, we conduct mail surveys on regional labor and management groups, regional labor offices, public employment services agency and municipalities with case studies on Bucheon City and Kyeongki Province.

In a changing environment, there is a growing importance of local governance based on local partnership to tackle the issues of employment and human resource development at regional level. The participation of labor and management is very important in developing local governance for employment. However, in case of Korea, labor market policy has been monopolized by central government. There is little devolution, and very low participation of labor and management. It causes many serious problems such as low performance of employment programs, users' dissatisfaction, budget extravagance and etc.

According to our survey, regional labor and management, regional labor offices, municipalities all together think that it is necessary to decrease the role of central government and to increase the participation of labor and management in the regional employment programs. Especially labor and management strongly feel the need. In order to effectively participate in regional labor market policy, labor and management need to have the capacity for it. However, the survey shows that their capacity and resource are insufficient. In most of items such as human resource, budget, expertise, and network, the capacity of labor and management is investigated to be weak. Therefore active capacity building measures to fill the gap between the required capacity and the actual capacity

need to be taken for regional labor and management.

In relation to capacity building, regional labor and management need to make an effort for raising the concern and understanding of labor and management, hiring full-time staffs specializing in employment project, securing employment-related budget, nurturing activists, improving expertise and building cooperation network. For effective capacity building, in addition to regional labor and management's own effort, external support needs to be given to them. External support for capacity building includes financial assistance, education and training program, nurturing key personnel, providing information, advisory service and etc. The partnership body such as the Korea Labor Foundation is expected to take an effective role in external support schemes to labor and management for capacity building.

38. The Changes and Tasks of the Vocational Competencies Development in Korea

Taek-Soo Chung

The vocational training system was formally established in Korea with the legislation of the Vocational Training Act in 1967. Since then our vocational training system has evolved and contributed to our economic and social development. Despite its crucial role in our recent socio-economical development, reports on the history of Korean vocational training system are scarce.

The purpose of this report was to review changes in vocational training system based on my professional involvement in this area for 26 years.

In the first period(1967~1974), the initial formal system for vocational training was made. The second period(1975~1998) can be characterized as the compulsory vocational training system. The period from 1999 until now can be summarized as opening training market to the private sector.

Based on the review of the historical flow of our vocational training system, the following suggestions were made.

First, the key roles of government in vocational training should be refined to set rules for the game and monitor the implementation, and should not involve vocational training market directly.

Second, in order to facilitate the fair competition in the vocational training market, the process and the results of evaluation should be open to the public and the accessibility should be enhanced.

Third, the infrastructure should be established to clarify and to inform the providers the needs of training.

Finally, to cope with the rapidly changing era of information based society, we have to develop a vocational training system in which we can help people to be more creative and flexible with higher level competencies.

39. The Impact of Technological Change on Earnings Inequality: Analysis of the HCCP Data

Kang-Sik Choi, Ahn-Kook Kim

1. Introduction

With the advent of the knowledge-based economy, earnings inequality became worse in Korea like other advanced economies such as the United States. There are various factors affecting the earnings inequality: shifts in labor supply, shifts in labor demand and institutional changes in the labor market. The main cause of the widening inequality among others is changes in labor demand, especially changes in technology.

This study focuses on the impact of technological changes on earnings inequality in Korea. Using HCCP data set, this study tests the skill biased technological change among various workers.

2. Previous Literature

The employment and wage level in the labor market are determined by the labor supply and labor demand in a given labor institutes. Therefore, changes in employment and wage level are also affected by these factors: shifts in labor supply, labor demand and labor institutes. Shifts in the labor institutes include changes in minimum wage level, union density, changes in labor law and etc.

In explaining the widening wage gap in the United States as well as other countries such as Korea, many studies confirm the role of skill biased technological change. There are, however, other phenomena which can not be explained by the SBTC hypothesis. So, there have been various arguments on the changes in labor demand.

3. Model Specification

The modified Mincerian earnings equation is used to estimate the determinants of workers' earnings. Specifically, the dependent variable is log hourly wage, and independent variables include individual workers' human capital characteristics as well as one's job information. It also includes the technology level of the worker who confronts with at his/her job places. In this specification, wages of skilled workers as well as those of unskilled workers would rise when there are skill-neutral technological changes. However, when there are skill-biased technological changes, relative demand for skilled workers will arise. To identify the effect, the interaction terms between schooling years and technological change variables are added to the equation. Therefore, when there is skill a biased technological change, the coefficient of the interaction term between schooling years and technological change variable is positive.

4. Empirical Results

A. Data

The data set used in the empirical tests is the HCCP data built by the KRIVET. This first wave of this data was surveyed in 2005, and the second wave was surveyed in 2007. The population of the HCCP is the establishments in Korea and the survey samples were chosen based on the KIS Corporate Data(2005).

In the first wave, among the total 454 establishments surveyed, 303 establishments are from manufacturing, 35 establishments from financial industry, and 116 from non-financial service industries. In the second wave, 316 establishments are from manufacturing, 35 establishments from financial industry, and 116 from the non-financial service industry. The number of workers surveyed is 13,101 in the first wave and 11,473 in the second wave.

B. Earnings Equations

The explanatory powers of earnings equation(R2) are from 0.40 to 0.52 in the first wave. Returns to additional schooling year are from 0.76 to 0.10. As

expected, experience-earnings profiles show concave function which implies that the return to experience increases as experience becomes longer at a diminishing rate. Tenure-experience profiles also show a similar pattern. The coefficient of gender dummy representing the gender wage gap is about 18%～20%. Workers in the large establishments receive higher wages than those in small establishments.

In the earning equation, there are some proxies representing changes in the managerial environments such as "Changes in demand for the main products for the last three years", "The degree of difficulties in forecasting the demand for main products", "The degree of changes in developing and adopting new products", "The degree of changes in technologies for the last three years" and etc. The coefficient of "The degree of changes in technologies for the last three years" dummy is with statistical significance in the full model with industry dummies and establishments size dummies. Other dummy variables representing changes in the managerial environments do not show a consistent pattern across different model specifications.

However, the coefficient of dummy representing "The utilization of the Information System and its effect within the firm" is positively significant. The effect of patents, utility models, and design, which are direct measures of technological changes, are also significantly positive in all model specifications.

The empirical results of earnings equation in the second wave are mostly similar to those in the first wave.

C. Skill-Biased Technological Change Model

In the simplest model specification, the interaction term between years of schooling and "Changes in the market share of the main products for the last three years" is significantly negative while the interaction term between years of schooling and "The degree of changes in developing and adopting new products" is significantly positive. Other interaction terms such as "The degree of difficulties in forecasting the demand for main products", and "The degree of changes in technologies for the last three years" show inconsistent results.

In the full model specification with tenure, firm size dummies, industry dummies as well as the worker's characteristics, the interaction term between years of schooling and "The degree of changes in developing and adopting new products" is significantly positive. On the other hand, the interaction term between years of schooling and "The degree of changes in technologies for the

last three years" is significantly negative. The remaining two interaction terms do not show statistically significant results.

To analyze the effect of the "utilization of the Information System within the firm" with more detail, five sub-categorical questions are asked in five point scale(1 for the least, 5 for the most and the average is 3). The average point of these five questions is decoded as "IS_TECH" variable. The interaction term between years of schooling and "IS_TECH", however, shows significantly negative implying de-skillization with the information technological change.

The skill-biased technological change hypothesis is also tested using direct measures of technological change such as the number of patents, utility models and design. In the simplest model, the impact of the total number of patents, utility models and design is significantly positive. The interaction term between this variable and years of schooling, however, does not show statistically significant result.

Again, the empirical results of earnings equation in the second wave are mostly similar to those in the first wave.

D. Models by Gender

a. Men

For men, the interaction term between years of schooling and "The degree of changes in developing and adopting new products" is significantly positive. On the other hand, the interaction term between years of schooling and "The degree of changes in technologies for the last three years" is significantly negative. The remaining two interaction terms do not show statistically significant results.

The impacts of the "Utilization of the Information System within the firm" are significantly positive in the simple model as well as in the full model. On the contrary, the interaction term between years of schooling and "IS_TECH", however, is not statistically significant although the sign is positive.

Similarly, the impact of "the total number of patents, utility models and design" is significantly positive. and its interaction term with years of schooling, however, shows negatively significant result.

b. Women

For women, most proxies representing changes in the managerial environments do not have statistically significant impacts on workers' earnings

or show different results depending on the model specification. The impacts of the "Utilization of the Information System within the firm" are significantly positive in the simple model as well as in the full model. The impact of "the total number of patents, utility models and design" is significantly positive. in simple model while it is not statistically significant in the full model.

The interaction term between years of schooling and "The degree of difficulties in forecasting the demand for main products" is significantly positive. On the other hand, the interaction term between years of schooling and other dummies representing the managerial environments is not statistically significant or shows different results depending on the model specification. Similarly, the interaction term between years of schooling and "IS_TECH" and the interaction term between years of schooling and "the total number of patents, utility models and design" is not statistically significant or shows different results depending on the model specification.

E. Models by Industry and Occupation

In manufacturing, the interaction term between years of schooling and "changes in the market share of the main products for the last three years" is significantly positive in the simple model as well as in the full model. This implies that the educational wage gap increases as the "changes in the market share of the main products for the last three years" becomes larger.

The impacts of the "Utilization of the Information System within the firm" and its interaction term with years of schooling are not statistically significant. On the contrary, the impact of "the total number of patents, utility models and design" is significantly positive although its interaction term with years of schooling, however, shows negatively significant or insignificant result.

In financial sector, unlike the manufacturing, the interaction term between years of schooling and "degree of difficulties in forecasting the demand for main products" is significantly positive in the simple model as well as in the full model. However, the impacts of the "Utilization of the Information System within the firm" and its interaction term with years of schooling are not statistically significant. Also, the number of patents and the number of utility models do not affect on workers' earnings nor on educational wage differentials, but the number of design affects positively on educational wage differentials. Similar results are found in other service sector, too.

5. Summary and Policies Implication

The advantage of using HCCP data set is that “technological level by firm” can be used in the empirical tests rather than “technological level by industry” as they have been used in most other studies. The empirical results, however, shows somewhat different from those of other studies. It shows that skill-biased technological changes are not unanimously found in all workers. Depending on the level of human capital accumulation, industry and/or occupation, the educational wage differential increases as technological changes, and in other sectors, the educational wage differential has nothing to do with technological changes.

In this regard, policies on the human capital should be more classified and disaggregated. Moreover, the external environments and technology will change more rapidly. Therefore, education and training policies should be fine tuned depending on the workers’ human capital level as well as their occupations.

40. A Survey of Credentialism and Meritocracy in Korea

Yang-Bae Yoon, Mee-Souk Kim, Jun-Pil Ok,
Yeun-Ang Jung, Jung-Ho Yang

In the globalized society, the high-value and competitiveness of human resources are decided by the priorities of nation's power. In this situation, common people's and the staff's recognition to the credentialism and meritocracy are very important to the social environment. This survey is starting point to find the degree presenting sound society. Our main issue is that common people have different recognition of competency and diploma components from personnel staff in companies.

The trends about the credentialism and meritocracy are an index of the society. We know the diploma diseases and suggested several times to solve the problems. Until now many scholars tried to find the solution. But that is very difficult if the common people and personnel staff's minds are not changed.

As a result, in the future, same thinking to meritocracy between common people and personnel staff will be more important than now. And the personnel staff in companies recognized the diploma to be stronger than the competency in the recruit, but the competency was more powerful than diploma in the promotion. And there is a factionalism in the companies, that is especially based on the school and university.

By the generation, the thoughts about credentialism is very different. The young and old generations think the diploma is more important than competencies. But in the middle age, they recognize that the competencies are more important to succeed in the society. The other result is about the certification. Many common people said strongly that the certificate is one of the components of competencies, even though the personnel staffs said that the certificate is a component but the rate is low. Generally, we thought the certificate will be a signal of ability instead of schooling. But in this survey, the certificates get mythologized by mass. So we need to change and develop the certification's meaning. Particularly, the personnel staffs use it for recruit, promotion, and reward in the firms.

41. International Comparison of Female Human Resource in Formal and Informal Sectors

Joon-Mo Cho, Dong-Hoon Cho,
Tae-Hee Kwon, Kwang-Pyo Hong

This study analyzed current status of the female labor market and human resource development at the international level by categorizing the groups into formal and informal labor markets. Empirical analysis of Korean, US, and German labor markets revealed that the presence of a gender-complicated dual labor market was stronger in Korea compared to the other two countries.

This study also confirms that the choice of women to enter the informal sector is pushed by the interactively functioning factors of the economic recession and the dual structure of labor market rather than being pulled by the business opportunities as women entrepreneurs.

According to our analysis, the per capita social benefit rate which represents the increase in added value generated by the formalization of previously unformal sectors stands at 33.2%. This is comparable to the per capita social benefit rate increase of 28.8%(US) and 16.7%(Germany). This result suggests that the social cost incurred due to the allocation inefficiency of human resources caused by the gender-complicated dual structure of labor market is larger in Korea compared to the US and Germany.

As for the necessary policy remedies in countries experiencing gender-complicated dual labor market like Korea, routine policies directed to shift the labor market into the formal sector may not fundamentally solve the structural problems. Instead, human resource development policies that are tailored to the female workforce and can serve to vitalize the formal sector for female workers should be enforced. Such policy efforts will not only contribute to the diminishing gender gap by restructuring the labor market, but also to revamping the gender-complicated dual labor market.

42. School Specialization Plan for Promoting Career Development of Adolescents in the Republic of Korea

Jung-Hee Lim, Ji-Won Kang, Kyeong-Jong Kang

1. Research Outline

The purpose of this study was to develop a plan of introducing specialized secondary schools for activating career development of adolescents in Korea. Basic direction, operational system, short-term and long-term plan, and strategy for the specialization were developed through literature review, statistical data analysis, expert panel interview, and seminar workshop.

2. Basic Direction of Specialization

"The school specialization for developing the aptitudes and the temperaments of adolescents" was established as a vision of the secondary school specialization. The short-term objectives are to convert voluntary schools out of newly-established schools and private high schools into the specialized schools and to expand the school specialization after verifying the outcomes. The long-term objectives are to convert all high schools into the specialized schools and to convert some of the voluntary middle schools into the specialized schools.

To achieve the short-term and the long-term objectives, the strategies such as in-time temperament development, career education systematization, specialized in-school program operation, after-school aptitude program operation, aptitude exploration club activity extension, and specialized out-of-school programs and facilities utilization were presented. To deliver the strategies, students' thoughts should be changed, parents and teachers should be aware that students discover themselves, social support for eliminating the discriminative treatment according to occupational and educational background should be established, and institutionalized foundation for promoting the school specialization smoothly should be formed.

3. Operational System of Specialized Secondary School

For the operational system of the specialized secondary school to be settled successfully, a linkage system, in which future workforce are cultivated according to the aptitudes and the temperaments of adolescents, among middle schools, high schools, higher education institutes, and industries should be established.

Middle school students should choose appropriate type of specialized high schools based on their own aptitude and temperament. Basic education, technical education in specialized area, aptitude and temperament development education, and field experience education should be delivered in the specialized high schools. The graduates from the specialized high schools can get a job or continue their studies at higher education institutes. Employed workers can get a degree from corporate universities, cyber universities, and also from traditional type of universities.

4. Short-Term Plan of Specialization

Considering current school system, not all high schools can be converted into the specialized high schools within the short period of time. The short-term plan of the specialization consists of three stages. First, the aptitude and temperament education should be intensified in current type of high schools through various programs such as in-school programs, after-school programs, club activities, and out-of-school facilities and programs. Second, some of the voluntary high schools out of newly-established schools and private high schools can be converted into the specialized high schools. The specialization area should be determined by the school itself and the area should be differentiated from the existing special objective high schools. Third, after verifying the outcomes of the voluntary specialized high schools, problems and necessary measures can be identified and a foundation for all high schools to be converted into the specialized high schools can be established.

5. Long-Term Plan of Specialization

After verifying the outcomes of the short-term plan of the specialization, the

long-term plan of the specialization should be introduced. First, to establish a foundation for all high schools to be converted into the specialized high schools, the perceptions of students, parents, teachers regarding occupation, career, aptitude, and temperament should be changed, the legal and the institutional foundation for the operation of the specialized education should be established, sufficient fund should be secured, and related network should be constructed. Second, high schools should be converted into the specialized high schools based on the local environment and problems, so that the necessary measures can be identified. Third, some of the middle schools can be converted into the specialized middle schools and the aptitude and temperament education shall be intensified. A comprehensive career path, which links middle schools, high schools, universities, and employment, can be constructed.

6. Strategy for Specialization

To deliver the plan of secondary school specialization, following strategies are presented: 1) School autonomy and system improvement strategy; 2) Curriculum development strategy; 3) Appropriate teachers' and students' recruitment strategy; and 4) Network construction strategy. Autonomy in curriculum planning, autonomy in textbook choice, and autonomy in overall.

School operations are necessary for the school autonomy and system improvement. To develop appropriate curriculum in the specialization area, the process consisting of specialization area selection, job classification, workforce demand status and prospect analysis, job analysis, educational objectives creation, subject deduction, curriculum establishment, instructional design, textbook development, instruction delivery, and educational evaluation are presented. To secure appropriate teachers for the specialization education, strategies such as teacher relocation, retraining of current teachers, experienced field professional utilization, and exceptional overtime service permission in schools were suggested. To recruit students for the specialization education, public relations activities intensification, school experience program, student recruitment method improvement, student transfer system expansion, and more were suggested. Network strategy among specialized secondary schools, government(Ministry of Education, Science, and Technology), local government offices of education, and industries were presented.

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