

KRIVET

Research 2016

Abstracts of Research Commissioned by
National Research Council for Economics,
Humanities and Social Sciences(NRC)

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Foreword

The Korea Research Institute for Vocation Education and Training(KRIVET) is a national policy research institute, established in 1997 with the mandate of supporting national human resources development policy and the Korean public's lifelong skills development. It is affiliated with the National Research Council for Economics, Humanities and Social Sciences(NRC) under the Prime Minister's Office. Since its foundation, KRIVET has been leading the policy research in national human resources development and vocational education and training, while carrying out a range of research and projects in qualification systems, skills development and development of vocational education·training programs.

KRIVET has been annually publishing compilation of abstracts to share with other related organizations and experts in the area. This publication has been serving a informative and valuable guide to the readers and providing better understanding of TVET and HRD in korea. The abstracts in this volume are from 37 researches commissioned by NRC and conducted by KRIVET in 2016.

This annual compilation of abstracts introduces the research and projects conducted by KRIVET in 2016 to assist other related organizations and experts in the area to have better understanding of TVET in korea. this year's research topics include National Com Standards, linking education and employment and industry-academia cooperation with an aim to promote TVET.

It is hope that this “2016 KRIVET Research: Abstracts of research Commissioned by National Research Council for Economics, Humanities and Commissioned by National Research Council for Economics, Humanities and Social Sciences(NRC)” will contribute to the vitalization of vocational education and training as well as enhancement of the public's vocational competencies.



Dr. Lee, Yong-Soon
President, KRIVET

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Competence-based Society and Youth Labor Market

Chang-Kyun Chae, Sungsu Hwang, Jung-Seung Yang,
Heekyung Cho, Seung rok Hwang

The point of departure of this study was a lack of information on the employers' perspective on what makes university graduates employable. The study uses an innovative approach to look at employers' preference for university graduates, namely by simulating the selection process with hypothetical candidates. This so-called conjoint study with responses from 300 companies was complemented with in-depth interviews with personnel managers. The study provides insight into the key characteristics that employers look at when they recruit university graduates and the skills that university graduates should possess in order to be employable.

Skill and Employment : The effect of Corporate Social Responsibility based on fairness perception

Bom-I Kim, Ga-Woon Ban, Jung Seung Yang

The purpose of this study is to approach the skills and employment using the concept of CSR(Corporate Social Responsibility).

In order to enhance the workmanship of the labourers and to create more employment opportunities, we have looked into the potential of CSR and attempted to suggest its next course of action in the labor market. This research, using the concept of fairness perception, aims to explore how one's understanding of the CSR activity acts as a mediator that leads to the positive achievements as a corporation. Firstly, we aimed to examine how the various departments of CSR, including the activities in internal CSR and business relations CSR (assisting under syndicates), via fairness perception, - and through the increase of trust in the corporation and the emergence of reciprocity, - ultimately influence the performance of the corporation. And we verified that the CSR activity, based on fairness, manages to carry its legitimacy as one of the corporation management strategies. In addition, we discovered that CSR can also be revitalized under the following circumstances: when the decision-making authority that was only monopolized by the corporation starts being shared with the labourers, when the labourers gain more participation opportunities in the decision-making process, and when the labourers' rights to make decisions take effect as a counterforce against the management rights. As an outcome, it was demonstrated that this does not only motivate the labourers, but also raises the quality of working environment and alleviates efficiency and equity of the economy itself. Ultimately, this will furthermore enhance the workmanship of the economy and create more job opportunities.

A Study on Agent-based model for Labor Economics and Labor Market Policy Evaluation

Yang Jung–Seung, Kim Bomi, Ban Gawoon
(Korea Research Institute for Vocational Education and Training; KRIVET)

The most recent sequence of financial crisis and the increasing economic instability are letting us turn more and more incredulous, triggering the reflective need to search for a newer methodology on economic analysis. Furthermore, the rapid growth in information and communication technology as well as the advancement into more knowledge-based society are accelerating the rate of how fast this world is changing, creating more controversial topics such as the fourth industrial revolution, the introduction to Artificial Intelligence, Big Data, and so on. This sort of rapid social growth depreciates the accuracy of economic prediction, thus emphasizing the essential necessity to look for a newer economic analysis methodology.

Simulation methodology, agent-based modeling in particular, by supposing a disparate consumer and a disparate manufacturer and drawing a conclusion from analyzed results on computer, suggests a possibility that it could imitate a reality indescribable in former methodologies. Now that it can observe the agents' activities, it can create experimental situations and evaluate a variety of policy scenarios on a comprehensive basis. In addition, after having found out that a macroscopic phenomenon was shown as an outcome of their interactions between disparate individuals, this has made it easier for us to explore the relationship between a microscopic activity and the macroscopic phenomenon.

The following research includes the experimental incorporation of a dynamic model of education-training, in an attempt to introduce agent-based modeling as one of the methodologies on economic analysis and to discover its applicability as a tool to evaluate labor market policies. As a result, we hoped to leave the door open for agent-based modeling to be actively sought for as an economic

analysis methodology and to be utilized for policy making and during its evaluation process.

After analyzing the data gathered from the dynamic model of education-training, it was demonstrated that a strategy involving a corporate investment in education-training was inferior to a strategy without the corporate investment in education-training. Nevertheless, for some enterprises, education-training investment strategy was more financially benefitting, therefore in a societal context, allowing education-training investment enterprises to have a long-run in the industry.

On the other hand, financial support did not only accelerate economic production, but also increased societal efficiency by putting more weight onto education-training investment enterprises. Therefore any form of financial support from the society in education-training, up to certain extent, was considered necessary, if hoping for increasing societal productivity through education-training investment. Moreover, career education-training of the people in the low-income bracket and the jobless was noted indispensable, at least to prevent failure in equity due to increasing wage inequality.

Study on National Skills Outlook

Ga-Woon Ban, Bom-I Kim, Dong-Man Na,
Jung-Seung Yang, Gyu-Hee Hwang

The main objective of this research is to develop a model for skills outlook and to propose its outcome. This research is composed of 3 stages in total. Each suggests has its own prospects, yet the combination of the 1st stage and the 2nd stage leads to the skills outlook for the 3rd one, thus the final outlook in this study is the 3rd stage.

The 1st stage suppose that the professional distribution in the profession is fixed and presents a skills outlook by reflecting the changes in employment distribution between careers. The 2nd stage predicts the changes in employment distribution in the career by using Delphi method. Lastly, the 3rd stage is the combination of the first and two stages.

The skills for the outlook object in this year's research includes 34 middle categories of NCS Vocational Core Competencies. The method of investigation was to select the most important skill out of those 34 areas. In this case, the importance of the following skill can be marked in percentage because it is simply choosing between either 0 or 1. In other words, this research offers the importance about specific skill of specific jobs that evaluated by a specific company by a certain percentage, and shows how many percentage that importance would rise or fall in the future.

The underlying meaning of the outcome of this research is as follows: Based on the service sector, which is limited to service industries using this year's data, it is identified that some skills become more important in future than present. The skills in basic foreign language, human resources management, strategy application, cosmopolitan outlook, and the understanding of management are such examples. However, these skills are measured in terms of future importance changes compared to the present, and even if they do become more important, some of them would still has low importance in an absolute standard.

One entertaining factor is that there is no skill to feel difficult in eliminating disparities when analyze of how difficult it is to eliminate disparities between important skill of the present and the future. Henceforth, even if a corporation consider a skill important for the present and the future, the disparities in skills caused by that evaluation would be eliminated pretty easy. This has a lot to do with how our countries' corporations do not require that many highly skilled people in a working environment.

A Study on Support and Utilization of Korea Collegiate Essential Skills Assessment(K-CESA)

Youmi Son, Chang-Yong Song, Eon Lim

1. Introduction

K-CESA(Korea Collegiate Essential Skills Assessment) is the standardized assessment tool to evaluate and utilize essential skills of student in collegiate level by leading the colleges to have the interest and practice of essential skills. As learning outcomes, essential skills are regarded as important concept in the field of higher education and human resource development. K-CESA had been a long-term project of 6 years from 2009, and completed in 2014. Improvement in sustainability and utilization of K-CESA, and securing continuous discussion on essential skills is necessary for the further stage. Hence, the purpose of this study is to develop a system by enhancing the supportability and utilization of K-CESA. This study will be carried out as the ten-year plan, and 2016 is the first year.

2. Performance of K-CESA

The number of colleges for K-CESA has increased steadily from 34 colleges in 2013 to 64 colleges in 2015, and it is estimated at 78 colleges in 2016. The number of students is 22,467 in 2013, 26,308 in 2014, and 10,101 in 2016 (January ~ June). According to the survey of K-CESA, it proves that K-CESA is a practical tool for assessing student's essential skills, evaluating the performance of government funding programs, and examining the curriculum outcome of participated colleges.

Even though K-CESA performances show several advantages, there are some challenges. Since large-scale financial support colleges are the main user of K-CESA, there is need to pursue assessment and consultation for small/medium-

sized and non-financial support colleges in the future. Moreover, identifying participating motivation, developing programs and support plans by analyzing the actual status of essential skills enhancement programs is necessary.

3. New Question Item and Mobile Application Development

As the number of participating colleges and students increased and essential skills are measured repeatedly, developing new question items to improve the quality of K-CESA system became necessary. Among six essential skills of K-CESA, global skill has the highest utilization rate. Thus, developing new question items of global skill is firstly decided in 2016. In addition, two mobile platforms(Android/iOS) have been built to replace speaking sub-area of communication skill answering system by web recording. This is designed to operate in the same functions and steps regardless of the platform. The mobile application development is expected to improve completion rate of communication skill area. Assessment support using the mobile application has the advantage that K-CESA website or system will be more easily accessed by mobile device than PC.

4. Case Study for K-CESA

The necessity for establishing indicator that can show student's improvement in educational competency have emerged. K-CESA is a tool to indicate essential skills performance in ACE project and PRIME project. The colleges are having an active discussion on essential skills, and practically use K-CESA to develop its own assessment tool, to create and reform the curriculum based in essential skills. In this study, Konkuk University and Catholic University of Pusan are shown as cases of best practice for utilizing K-CESA. These colleges are characterized in deriving essential skills from their founding ideology, ideal model of students, and advancing plan. Both cases link essential skills to the process of creating and improving the curriculum, and especially link essential skills to the subjects. Also integrate the results of essential skills-based curriculum or non-curriculum with education and consultation system.

5. Implications

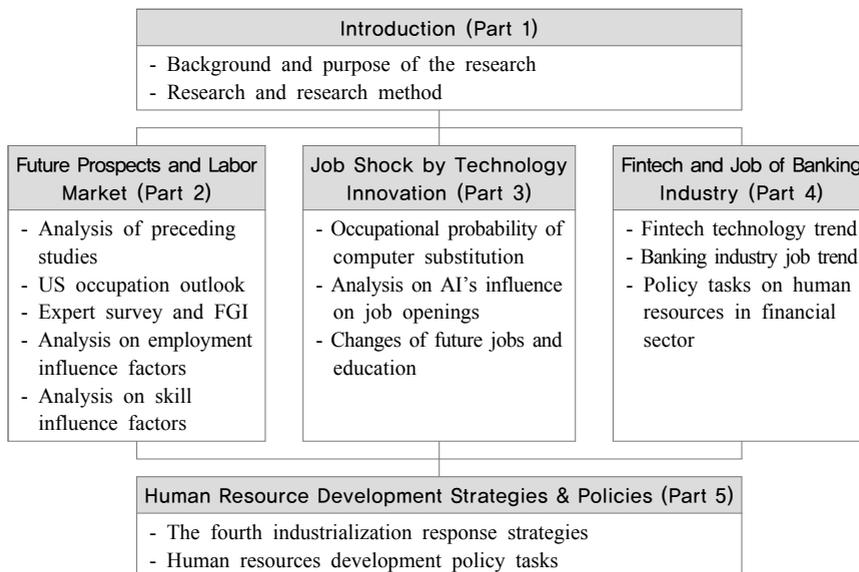
Based on K-CESA performance results, implications and suggestions for policy making are as follows: 1) Develop additional questions for the accurate essential skills assessment, 2) Continuously modify and supplement the questions for each essential skills, 3) Exploration and development of new essential skills, 4) Diversification of college's essential skills enhancement in support service, 5) Establishment of DB for strengthening competitiveness in higher education and smooth transition of youth to the labor market, 6) Generate new issue for curriculum plans and career guidance by data analyzing, 7) Improve utilization of college financial support project performance index, and 8) Research collaboration with PIAAC survey tool and K-CESA for international comparison of essential skills.

The Future of Jobs and Human Resource Development Strategy

Ho Young Oh, Huijung Chu, Daeseon Choi

The purpose of this paper is to provide the prospects of the future society expecting to experience dramatic changes in the occupational world and to come up with strategies for human resource development to adapt to the future society. To achieve this, we attempt to derive the human resources development strategies necessary for the future by making forecasts on the following aspects: major technological, social-economic transformations within a decade, the influences technological advance that may bring upon the labor market on vocational levels and lastly the changes on the demand of skilled labor.

[Diagram 1-1] Research

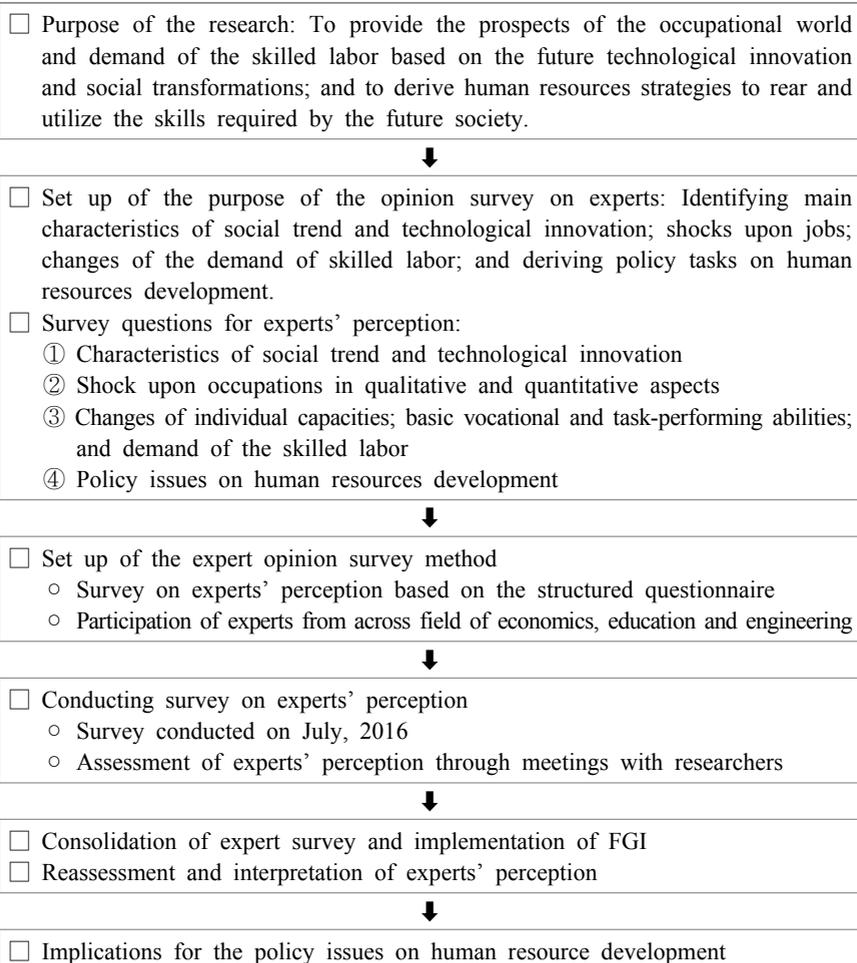


Source: Written by the author.

□ Opinion Survey on Experts and FGI

In order to learn the future prospects, occupational changes, demand on skilled labor and to scrutinize the human resources development strategies, this paper has conducted opinion survey on experts, along with FGI that was utilized to derive qualitative traits. To acquire objectivity and rational future prospects, the opinion survey was conducted on a variety of experts from a range of sectors such as economics, education, engineering and others. And based on the results from the survey, a round of FGI was conducted on experts again. The following depicts the research procedures and its major outcomes.

[Diagram 2–1] A study on experts' perception and process of FGI



Source: Written by the author.

Implications below can be drawn from the analysis above.

First, according to the survey results, unlike previous expectations on how the influence of the technological innovation may be bigger than that of the social trend changes upon occupations, the expert FGI has suggested, owing to the active discussions already in place for the technological innovation, there is a greater need on the consideration of the social trend, which has been given little attention. Social trends and technological innovations are at an inseparable relations and, because of the interaction existent between the two, a more comprehensive approach must be taken, instead of slanted policy responses upon technological innovation.

Second, communication skills, numerical and physical abilities are ranked as the lowest priority in importance in the future since they can easily be substituted by machines, while cognitive abilities and problem-solving skills are considered to be of high significance as they both are related to creativity. This suggests the current school education must be aligned against the future demands on the skilled labor and to take preemptive responses therein.

Third, education policy has been regarded as the most significant factor among policies in education, training and labor, in order to respond to the fourth industrial revolution. Especially, training human resources through higher education has been considered as the key factor of enhancement of national competitiveness. In the view point of urgency of a policy, labor policy was ranked at the highest. And as the matters pertaining to methods to respond against the fourth industrialization involve establishment of new labor standards and comprehensive approach on work, education and welfare, all of which require social consensus, it is necessary to take time to create a public discussion across a long time frame.

□ Computerization's Shock upon Occupation and Skilled Labor

By applying the occupation computer substitution probability that was estimated by Frey & Osborne(2013) upon Korean data, we have analyzed the influence of computerization in the occupation world. The data references used for the empirical analysis are 「Regional Employment Survey」from the National Statistical Office and 「Graduates Occupational Mobility Survey」from Korea Employment Information Service.

One of the first major findings exhibits, among the list of industry categories that are in high-danger stratum in being replaced by computers as of 2015, transportation businesses have the highest probability of replacement at 81.3%, wholesale and retail trade at 81.1%, banking and insurance at 78.9%, facility management and business support service at 70.3%. Analysis from occupational substitution risks depicts the following percentage of chances: 100% of sales marketer, 93.9% of machine operators and assemblers, 82.9% of functional occupations, 73.7% of simple labor workers. Ranked at the lowest risks of substitution are experts at 0.9%; managers at 8.6%, and service workers at 24.1%. The impact of computerization shows a huge gap amongst differing industries and occupations, making it peremptory to seek for vocational training methods that may facilitate the human resources migration across different industries. Human resources development methods such as school education and vocational training must take into account the above mentioned aspects.

Second, when computer substitution probability is analyzed based on individual properties, the cohort groups whose occupational shock is expected to be most severe by the technological innovation are men over women on the gender basis; middle age group of population older than 50 on the age basis; and lastly people with lower than high school diploma on the education basis. However, it has been observed that, even among those who hold high degrees (higher than four year college degrees), the ratio of population working in positions highly susceptible to substitution by computer have been relatively rapidly increasing. People aged over 50 was educated during the industrialization era and, thus, are not familiar with internet and mobile environments. They are faced with the reality to prepare for 100 year life expectancy era by maintaining and developing their employment capacities as much as possible to improve the insufficient old age preparation status. To cope this phenomenon, we need to open the education system what is now closed to students at the right age levels and make it easily accessible to middle age groups; and innovate the social system and working methods to allow the room for simultaneous approach on both work and education. Without such approaches, the mass unemployment of population of over the age of 50 is inevitable and this will eventually lead to reduced national industrial competitiveness and a crevice in the welfare system.

Third, within the pool of four year college degree holders, the ratio of workers in the high risk of being replaced by computers is 19.8% as of 2014, and 33.9% for its two year counter part, which is higher by 14.1%. Four year

college degree shows higher substitution probability in society and humanity majors, while two year college shows high probability in the field of humanity, society, engineering and science. The majority of the office manpower in the liberal arts group bears high likeliness to get unemployed if the uses of AI and robots become prevalent, therefore it is crucial to innovate the school education system to help them rear the necessary capacities for the future society. To realize this, national attention must be drawn upon innovations on teaching-learning method, school system and strengthening of higher education competitiveness to build a sense of consensus.

□ Fintech and Financial Industry Job

The advent of various FinTech services have forecasted dramatic changes in the financial industry and is expected to greatly alter the landscape of the labor market. This study seeks to shed light on the correlations between the spread of FinTech and the fluctuating patterns of the finance sectors. Based on such speculations, this research has analyzed the growth & decline and establishment & disappearance of financial professions in order to deliver adequate human resources development policies which are to cope with the sweeping changes.

The spread FinTech have, or in the foreseeable future will, spur vast changes powered by IT innovations. As of 2015, Korea Standard Industrial Classification narrated that the ratio of employees affiliated in high-risk computer substitution in the financial industry was at 78.9%, 3rd out of 21 industries in the major classification standard. In contrast to 2007 statistics, numbers in 2013 illustrate that graduates in higher education being employed in the financial sector have dramatically decreased, as four year college graduates diminished by -36.3% and two year college graduates by -70.2%.

The FinTech fever will expand the role of existing financial industry or transpire newfangled labor necessities which will mainly include data analysis, product planning for new services, IT jobs such as service system design / development / operation, and marketing for new services. A visible difference between in the financial industry will be that traditional IT occupations (service system design / development / operation), will develop and provide services that respond to a variety of service environments such as mobile, wearable, IoT, IT professions in Big Data, machine learning, and artificial intelligence.

Apart from the existing financial industry, it is forecasted that new demands for job opportunities will be created or expanded from FinTech providers. FinTech offers online services such as internet and mobile, a function that is absent in the current financial industry.

When seeking to transfer human capital from financial body to into IT traineeship, IT technical education must concentrate on data science technology. The curriculum must at least cover state of the arts big data, mobile, IOT, and block chain, and practical application of artificial intelligence programs. Following measures are proposed in order to shift the workforce in the diminishing traditional financial sector to a job field where the future roles are expanded through reeducating or training. It is vital to focus on retraining human capital to meet the demands from IT technology and develop the working competency in the sales & marketing duties and smoothly make transition into technology-based FinTech services.

Human Resource Development Strategy and Policy Tasks

Fundamentally, the development pace of education cannot align itself with the speed with which the technologies advance. Current school education and vocational training centers mostly focus on capacities that are conducive for manufacturing, technical and office posts, which will bring significant amount of turmoil into our society if, through the fourth industrialization, robots and computers replace most of these positions. If these posts do not get substituted by computers and robots, national competitiveness will inevitably lag behind, however, should the posts get replaced, the country will face the conundrum of having to care for the laid off working population through welfare system who did not have sufficient preparation for the future society. It is about time we reflected on what and how we will teach and which ability to help grow for the youth and students to incubate the strength to survive and adapt to the future society. Based upon this, we need to come up with the blue prints for innovation of education training and gather the national sympathy upon the subject matter. In addition, an inter connected system on work, education and welfare must be established in order to facilitate the conventional labor body to move between differing industries.

〈Table 5–2〉 Human Resource Development Strategy and Policy Tasks

Response Strategies	Policy Tasks
Centralization, Uniformity → Decentralization, Diversification	Re-establishment of school education governance system Expansion of teacher openness and relaxation of school founding requirements Expansion of school selection rights
General purpose standardized training → Training specialized professionals	Personally customized learning plans through non-graded credit system Transition to Project-Based Learning from lecture basis Innovation of teaching techniques such as Flipped Learning
Input basis → Competency basis	Development of teaching techniques using AI education robot Strengthening of career, skills, arts and physical education Expansion of computer and software education Introduction of STEAM
Individual academics centered training → Convergent training	Reinforcement college's innovative capacities through innovation ecosystem Foundation of innovative university without campus Empowerment of college such as autonomous college entrance system
Division of work on department basis → Cooperative work system under work, education and welfare	Introduction of laborer education year system Development of new working standard in line with the knowledge & information era Expansion of flexible workplace and working hour reduction

Note: Chapter five second part, human resources development policy tasks, has been summarized.

The NCS-based Qualification System: Diagnosis and Future Tasks for Improvement

Dong-Im Lee, Jeong Yoon Cho, Ji Wun Jung

In order to develop a field-oriented qualification system as a part of efforts to push for President Park Geun-hye's state affairs, National Competency Standards(NCS) was developed in accordance to which, the qualification system has been reformed. However, as the new qualification system is in its initial stage of implementation, the systematic structure of 'qualification planning - qualification operation - qualification utilization' based on NCS is not stable yet and thus the system is being implemented on a trial-and-error basis. Revealing its limitations, the qualification system has not been diagnosed in a systematic manner.

One of the goals of this study is to diagnose whether the NCS-based qualification system is being operated fulfilling its original purposes and whether the qualification management and operation system is in place supporting smooth application of the qualification system in the labor market. The study also aims to analyze the problems arising in the process of carrying out the system and to come up with tasks for improvement.

In order to achieve these goals, comprehensive reviews were made on a variety of literatures and diverse study approaches were adopted including interviewing experts, conducting surveys, visiting educational institutions and industrial fields and holding policy seminars.

This study deals mainly with the followings. First, the theoretical background is reviewed concerning 'diagnosis of the NCS-based qualification system'. As for domestic implementation of NCS-based qualifications policies, the current state and recent developments are analyzed, while analysis results and implications of qualification policies in major foreign nations are also examined. With a view to establish an analysis framework for NCS-based qualifications policies, comprehensive reviews are made to find out the background and analysis

methods of other policies. In addition, based on the new framework, the NCS-based qualification policies implemented so far are assessed with their problems identified and future policy tasks are suggested to solve the problems. The policy tasks proposed by this study are as below.

1. Reform of the Qualifications Management and Support System

First of all, the roles of the Qualification Policy Deliberation Council and the National Technical Qualifications Policy Deliberation Council should be redefined. In other words, they need to go beyond the role of a policy coordination organization and make efforts to establish a more integrated framework for management and deliberation of qualifications. Second, in order to increase the policy efficacy the ministries and departments concerned, which are upper level policy enforcing organizations, should strive for cooperation and the possibility of integration, if necessary, should be reviewed. Third, effectiveness of NCS-based qualifications and policies should be raised and the service areas of the Human Resources Development Service of Korea should be reallocated. Fourth, although ISC is important and necessary, it is required to carry out an objective evaluation on whether ISC is able to properly carry out its currently commissioned works such as surveying and analyzing the current state and demand of human resources by industry, planning and operating qualifications, and establishing certification standards for the course-based evaluation qualifications and the work-based learning system. If needed, the ISC should be restructured which requires a prior evaluation on appropriateness of its sphere of activities and size of the organization. Fifth, it is also advised to make a review on introduction of a performance-based financial support system in order to promote healthy growth of the ISC.

2. Reform of the Qualifications Operation System

Most importantly, it is required to prepare a basic philosophy to operate NCS-based qualifications (especially the course-based evaluation qualifications). If the course-based evaluation qualifications are to become competency-oriented qualifications based on the NCS, corporate participation on operation of the qualification system is mandatory, which means field practicum should be included as part of the education program for acquisition of qualifications.

Second, in order to make the course-based evaluation qualifications more field-oriented, the qualification subjects should be replaced with the NCS-based new job qualifications subjects designed by the industry. Third, the course-based evaluation qualification system integrates the education and training courses into the existing test-based qualification system mainly operated by the Ministry of Employment and Labor. This integration implies that internal evaluation has become critical requiring enrichment in education programs. For this purpose, it is urgent to prepare competency evaluation standards, enhance objectivity of internal evaluation results, minimize gaps among students in different education organizations, improve internal evaluation manuals, strengthen competence of internal evaluators and establish a system for management of internal evaluation results. Fourth, as NCS-based qualifications should have evaluation tools conforming to performance criteria, it is needed to verify that the external evaluation conforms to performance criteria. In addition, a verification process should be put in place in order to find out whether the evaluation tool and the NCS performance criteria are valid, sufficient and field-oriented. Fifth, in the mid-to long-term, the current external evaluation system should be transformed into an evaluation verification system. In more detail, external evaluators should focus more on checking if the education and training organization is strictly carrying out internal evaluation, if a re-education system for internal evaluation dropouts is in operation and if the evaluation evidence materials based on the performance criteria is appropriate, rather than focusing on evaluating learners. For this, it is desirable that high performing organizations should take the initiative in changing the external evaluation into external verification. Sixth, the monitoring should be conducted in a more detailed way. That is, the monitoring should be more concentrated on checking whether internal evaluations are carried out fulfilling the desired achievements defined in the NCS performance criteria and particular consulting services should be provided to poorly performing organizations. Seventh, it is required to seek ways to simplify administrative works of those education and training organizations operating the course-based evaluation qualifications. Eighth, a consultation body representing relevant organizations should be established to further develop course-based evaluation qualifications.

3. Reform of the Qualification Utilization System

First, monitoring should be regularly conducted on the current state of utilization of NCS-based qualifications in the labor market and the achievements of the qualifications, shown in a scientific manner, should be analyzed. Second, various infrastructures should be established to find out whether the course-based evaluation qualifications are making positive effects in the labor market than test-based qualifications. The qualifications achievement analysis results should be considered in the process of pursuing financial support projects of ISC promoting its active participation in operation of the course-based evaluation qualification system based on NCS.

Utility Evaluation of Private Certifications II : Establishing utility Evaluation System

Sang Ho Kim, Young Ryeol Choi, Jeong Yoon Cho, Yu Jin Lee

This study is 2nd year research of its 3 years research project on utility evaluation of private certifications. This utility evaluation is performed by using most of the evaluation system proposed on the 1st year research. The targets of this evaluation are private certifications authorized by the state on May, 2016, which were willing to participate on this utility survey. Overall summary on the evaluation research is as follows:

First, the satisfaction value on authorized private certifications by ministries are 3.58, which is higher than the median value of 3. As the common satisfaction value result is way beyond the median value, the absolute value is not a high level.

Second, classifying the vocational certifications and basic vocational certifications, the result shows that the utility of vocational certifications have higher utility value than basic vocational certifications in every respect.

Third, in terms of the areal utility of state authorized private certifications, non-economic utility and management operation of private certifications show high utility value than average value. This indicates that existing private certification market is more focused on improving the individual competency not on entering into the job market.

Fourth, in terms of the infrastructure of state authorized private certifications, hardware-wise infrastructure has higher value than the software-wise one. This means that certification system shows lower average value than that of the organization's management operation capability. This demonstrates that state authorized test agencies are not fully displaying its ability. This is because many of certifications' test subject and test methods, which are the core of the certification system, are inadequately designed.

Fifth, the correspondence value of private certifications is also shown as below average value. This attributes to the fact that the existing state authorized private certification does not fulfil the improvement of lifelong vocational competency of people, which is the purpose of establishing the system.

Sixth, although some of state authorized private certifications claim to advocate vocational qualification-test, they did not properly function, and some other basic vocation related authorized private certification functioned as vocational qualification-test.

According to its evaluation result, this study would like to suggest a policy recommendation. First, classifying vocational qualification- test and basic vocational qualification-test when it comes to authorizing the private certifications. Second, simplifying the re-authorizing procedure for the certifications with high utility value. Third, reinforcing the inspection regarding non-participating agency and test subject. Fourth, reinforcing the management of certification quality through feedback on evaluation result. Fifth, granting incentive to already registered private certification when it's newly authorized.

Government Support Strategies for Enhanced Local Universities Competitiveness

Jaesik Jun, Tong Park, Gigon Nam

This study aims to investigate and suggest the direction and process of how to design human resources support strategies by interrelating the government departments and local universities in order to foster local universities with a competitive edge, responding to economic, industrial, and population changes.

The local universities are facing a crisis. The reduction in the number of students has caused a decline in the enrollment resources of local universities. In addition, the education imbalance between regions aggravates this crisis. It is estimated that, 35 regions corresponding to 38.5% among 91 non-capital regions such as local, state and national are categorized as areas that could result in a deepening of this crisis. If all universities located in the areas that pertain to the possibility of university crisis are disbanded, it is estimated that 32 billion dollars of monetary resources and the employment of 240,000 people would disappear. In this regard, the crisis of local universities are not only the obstacles they should overcome, it also has negative effects on the local economy and local labor market.

The responsibility to boost the competitiveness of local universities falls on not only on the local universities themselves, but also at the national level. In this sense, the government should be involved actively to enhance the competitiveness of local universities.

It is necessary to discuss the solution to the local university crisis by interrelating the central government, local government and local university. To do so, it is imperative to conduct a comprehensive analysis of the population structure, industry, education, and employment. Based on these statistics, the policy direction and issues for the enhancement of local university competitiveness could be explored.

The current study attempted to reveal the following. First, it is estimated to what extent the range of the areas pertaining to the possibility of the university crisis and the consequences have an impact in the local community. Second, the level of importance analysed by categorizing the criteria that enabled the evaluation of the competitiveness of local universities. Third, the status and effect of the policy conducted by the central government for the enhancement of the competitiveness of local universities has been scrutinized. Lastly, the local governments' policies and projects aiming to enhance the competitiveness of local universities are investigated as to what extent they are well-conducted at the localization level.

A Study on Method to Share Roles between Vocational Training Institutions According to Job Level of Industrial Manpower

Soo-Jeong Lee, Jae-Yeong Ahn, Dong-Yeol Park

1. Research Summary

To cultivate and apply manpower required from the highly skilled society from now on, the role of education policy for systematical human resources development since high school stage to college and university has become more important. However, as for the current state of vocational education, it has been pointed out as chronic problems such as absence of system to deliver changes of industrial structure and occupational manpower demand in the education and training systematically, severance between learning from school and business work, and lack of on-site technical expertise of teaching staffs etc.

In this research, it is tried to pay attention to provide educational experience of contents and level for school by the vocational education institution per school level based upon NCS. To achieve the above-mentioned purpose, in this research, it has been discussed role division by focusing on curriculum systemized method for relevant major areas in the high school, college and university by focusing on three job areas. And it has been proposed the policy to contribute toward competency centered society by enhancing the reliability for vocational education and improving satisfaction for education of students through cultivating manpower per job level required from labor market.

The major contents of this study are as following:

First, it would be searched the necessity of role division of vocational education institution through analyzing advanced studies and policies etc.

Second, it would be analyzed the education contents and level of curriculum of vocational education institution per school level.: Consistency of curriculum contents per school level based on the contents and level of competence unit of three job areas (hair beauty, production of electronic devices and software development)

Third, it would be comprehended the current state of job level and manpower type of industrial manpower: Method to strengthen ability according to job level of industrial manpower, performance expectation level per school level and suitable academic background ability for three job areas (hair beauty, production of electronic devices and software development)

Fourth, it would be drawn policy proposal to share roles of vocational education institution.

To achieve above-mentioned purpose, it has been analyzed domestic and foreign advanced researches and literatures and applied policy seminars to draw policies, questionnaires targeting industrial workers, analyzing gap between curriculum per school level of vocational education institution, and expert conference etc. Especially, in this study, it has been aiming efficiency and substantiality to perform the research by limiting study subject to three job areas (hair beauty, production of electronic devices and software development).

2. Curriculum Analysis of Vocational Education Institution per School Level

In this study, it has been analyzed the consistency between the range and level (affiliation) of contents elements in the curriculum of subjects related to three job areas per school level and corresponding NCS competence unit (contents and level) based on the analysis framework.

First, as the results to analyze the contents range in the curriculum per school level such as specialized high school (Meister high school), college and university etc related to three job areas (hair beauty, production of electronic devices and software development).

Second, in case of hair beauty, the tendency of general consistency between NCS (competency unit) level corresponding L2 and L3 level and contents elements in the curriculum per school level was appeared in order to high school, college and university, so it is considered it is appropriate level to educate in the high school. Only, there was very big gap of consistency between competence unit contents, so it is judged to need job analysis check.

Third, in case of production of electronic devices, the consistency between NCS (competency unit) level corresponding L2 and L4 level and contents elements in the curriculum per school level was appeared average about 1, so it is very low and it shows almost similar numerical value per school level. That is, it has no significant difference in the curriculum contents and level per

school level, so it is judged to prepare systemized method for the curriculum contents and level per school urgently.

Fourth, in case of software development, L3, L4~5, and L6~7 appeared relatively higher and comparatively even distribution compared to other two area which has different consistency between NCS (competency unit) level and curriculum per school. However, as for the consistency per NCS (competency unit), it has very diverse aspects per school.

Therefore, as for the part which has great difference between levels or overlapped phenomenon of educational contents related to NCS (competency unit) of relevant job area in this study, it has been required to analyze the cause of those phenomena thoroughly by adding more schools to analyze due to follow-up study.

3. Investigation on the Current State of Job Level of Industrial Manpower and Job Level

In this study, it has been conducted the questionnaire targeting total 300 people of 100 workers with more than five-year-career in the three job areas (hair beauty, production of electronic devices and software development). Through the questionnaire, the opinions of industrial workers for the major items such as academic background career of workers, minimum required academic background career, minimum required hands-on-background, expected level to perform per school and order of priority for the participation of the company in the school education etc.

First, in case of job area of hair beauty, as for the L2 and L3, the industry answered that high school graduates are appropriate. However, in case of hair beauty, it has been relatively established department related to cosmetology in the colleges and universities in the present, so it is hard to see that the role division for appropriate manpower for the job level per vocational education institution has been done properly. Therefore, it is required to reconstitute the curriculum with the contents that L2 and L3 would be cultivated in high school, L5 would be divided in partial high schools and colleges and more specialized and professional contents and reduced overlapped contents with other school levels would be in four-year- colleges and universities.

Second, in case of job area to produce electronic devices, the industry answered the high school graduates and college graduates are appropriate as for

the L2 and L4. Therefore, by considering academic background, it is required to divide and cultivate L2 in high schools and colleges, and L4 in colleges. Only, in the present, the college teaches major contents related to area to produce electronic devices overlapped to this, so it is required to reduce the relevant major contents and reinforce curriculum with the contents related to manager as for the L6.

Third, it has been appeared the most of workers in the area of software development are university graduates regardless of NCS level. That is, the corresponding works were appeared to four-year college graduates by considering opinions of the industry. Therefore, it is required to revise the corresponding major area of specialized high school to the curriculum related to other occupational category according to characteristics of high school.

4. Policy Proposal

The policy proposals by focusing on promotion works to do preferentially through the performance of this study are as following:

First, it is required to prepare the innovative vocational educational system and legal device to play a key roles of 'the educational world - the industrial world' in the national level.

Second, it is required that the industrial world would propose job category and level of jobs to cultivate and develop according to the level difference per school level and the educational world would establish the system to manage the quality of curriculum and competitive department based on this.

Third, it is required to secure the reliability to apply curriculum based on NCS through modifying and supplying NCS through industrial, educational and social agreement.

Forth, it is required to compose 'the Curriculum Development Committee Based on NCS' (tentatively) through vertical and lateral conference between vocational education institution per school level, and to develop 'Standard Proposal to Apply the Curriculum Based on NCS'.

Fifth, it is required to develop and supply NCS learning module which can be apply to 'the Curriculum Design - Management - Evaluation' for the curriculum based on NCS.

Sixth, it is required to establish more flexible curriculum system as in [Picture 4] according to the level of qualification per job area to emphasize the autonomy and responsibility of the curriculum based on NCS per school level.

Seventh, it is required to prepare 'the virtuous circle system of training based on the industry' by preparing enough compensation for the industry and developing and providing various training programs based on the industry to improve hands-on competency of teaching staffs.

Eighth, it is required to improve system to evaluate educational outcomes of vocational education institutions due to qualitative standard instead of quantitative standard.

Narrative Inquiries of Young Workers: Work, Learning, and Life of Vocational High School Graduates

Eon Lim, Jiyoung Kim, Dongyul Park,
Haegyong Lim, Heryung Jung

Recent policies for encouraging vocational high school graduates to enter the labor market instead of pursuing the higher education have been evaluated as effective. The employment rate of the vocational high school graduates has increased while the rate of advancement to the higher education right after vocational high school graduation has decreased. Nonetheless, at the individual level, it is not quite clear whether entering the labor market giving up or postponing higher education is a wise decision in the long term perspective. There is insufficient information on the reality of life of young workers after graduation of vocational high schools. The purpose of this study was to understand the work, learning, and life of young vocational high school graduates. Using the narrative inquiry method, it was intended to understand the working, learning and living of young workers in a wholistic way considering the context of their lives.

In order to have a theoretical sensitivity before conducting the narrative inquiry, the previous researches, theories and policies on work, learning and life of vocational high school graduates in the ages of 20s. 5 researchers interviewed 15 participants. 5 Participants were invited among the participants of a previous research in 2013, which focused on only the adaptation at the initial stage of working life of vocational high school graduates. 10 participants have joined additionally in this study. The criteria for choosing participants were at least 2 years of work experience after graduation of vocational high schools and age under 30. Variation in terms of job security, gender, size of firm, region, industry was considered in the final selection of participants. Each participant met a researcher three times. Series of meetings were held to share and tune perspectives among researchers before, during and after interviews.

15 narrative accounts were completed, from which several resonant themes were found and discussed. Themes on work are disconnection and alienation, endurance, transition and dream. Regarding learning, the meaning of universities as a mandatory insurance, luxuries, special opportunity and regrets were expressed. Vocational training was perceived by participants as stepping stone, investment, and exclusion. Informal learning was described with mentor, autonomous learning, and survival skills. Themes on living are marriage, military service, civic education and surfing the life. Some of these themes have sub-themes.

Based on the narrative inquiries and resonant themes, policy implications were discussed as the following topics: the danger of too much emphasis on the employment rate as a criterion of evaluating vocational high schools; the possible benefits of supporting vocational high school graduates with sufficient job experiences and higher education to be teachers for technical education in vocational high schools; the importance of basic general education, the need for financial support for higher education; career guidance service for adults focusing on lifelong learning; improvement of working condition in the external labor market.

The possible researches using the narrative inquiry method in the area of vocational education and training were suggested.

The Research Calculating Standard Education Cost Needed to Operate NCS based curriculum at Secondary Specialized Highschool

Young–Min Lee, Jae–Young An, In–Yeup Kim

1. Research Overview

After the minister of Education developed National level NCS based on secondary specialized highschool curriculum, it made an official announcement September, 2015.

As 2009 revised curriculum turned into NCS based secondary specialized highschool curriculum, existing 5 affiliates restructured 17 subjects group and 62 standard departments revised 47 standard departments. Also contents of education changed academic system into industrial based working level.

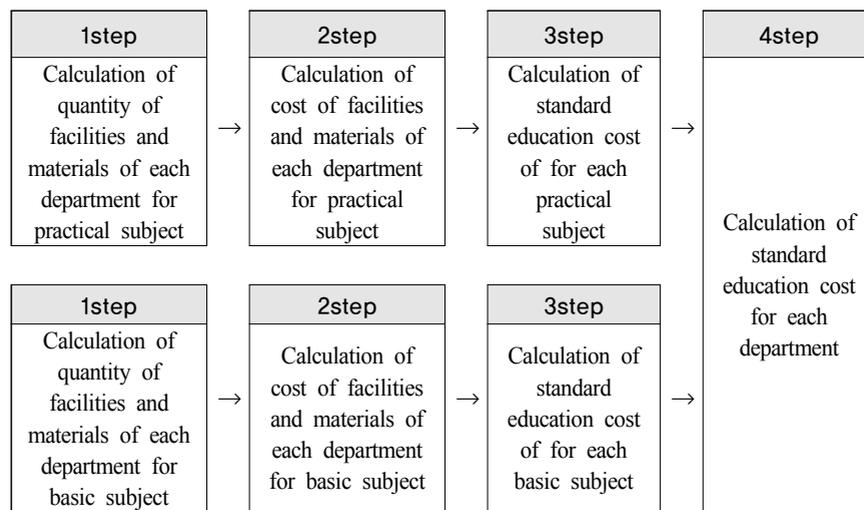
As under curriculum in secondary specialized highschool curriculum changed like this, it is necessary to consider a countermeasure about cost estimation required to perform education activities under new curriculum, establishment of target to get education fund, devising methods of fund supply, and efficient distribution and application of funds procured

As part of such a countermeasure, this research was performed in order to create a model for calculating proper standard education fund to be required in operating NCS based curriculum at secondary specialized vocational highschool. And then it was done to calculate the scale of standard education fund to be required in operating each representative departments of 17 subject groups on the basis of this model. Finally, it was to suggest meaningful policy methods about establishment and distribution of standard education fund for operating NCS based curriculum.

2. Research Result

A. The model calculating the standard education cost for operating NCS based secondary specialized highschool curriculum.

The model calculating the standard education cost for operating NCS based secondary specialized highschool curriculum was developed like the following figure.



B. Result of standard education cost

1) Result of Calculation of standard education cost for each practical subject on departments

Fiduciary on 6 class, if we describe from the largest, standard education cost of for each practical subject on departments was 856,567 thousand won, for mechanical engineering department, 805,698 thousand won, for electricity department and 633,147 thousand won, for chemical department. If we describe from the smallest, business and office work department was 181,372 thousand won, for information and computer department, 217,991 thousand won, and for industrial facility department, 286,780 thousand won.

2) Result of Calculation of integral standard education cost for each practical subject and basic subjects on departments

Fiduciary on 6 class, the biggest integral standard education cost was 994,819 thousand won for mechanical engineering department, next smaller was 517,859 thousand won for animal resources department, and next smaller was 225,561 thousand won for business and office work department.

3. Suggestion of policy

Policy proposals suggested as a result of this research are the following. First of all, government_level policy research of all components constituting standard education funds in order to operate NCS based curriculum at secondary specialized highschool will be performed periodically.

Second, subsequent research to calculate standard education fund will be performed with all kinds of basic subjects and practical subjects.

Third, government, Ministry of Education, will have to set up a goal and make strategies to procure education fund on the base of the result of this research

Fourth, the criteria of delivery for financial grants for local education of 17 provincial education office will change affiliation base into NCS department base.

Finally, the policy to consider a countermeasure about preparing expensive facilities and materials according to operate NCS based curriculum will be needed, and the policy to restructure specialized highschool to be classified affiliation base into subjects groups base will be needed.

A Research for Career Development and Employment Activation of Humanities Graduates

Hyoung-Han Yoon, In-Yeop Kim, Ga-youn Kim
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1. Introduction

A. The purpose of Research

Although humanities majoring students have a lot of strengths compared to other major students, they have been neglected in career development and employment support. It is necessary to plan ways to promote career development and employment so that 4-year college students majoring of humanities (literature, history, philosophy, etc.) will be able to economic activity in their field of study after graduation. The purpose of this study is to suggest a way of humanities majoring graduates to work by utilizing their field of majors.

In this Resrarch, “humanities graduates” refers to those who hold a bachelor’s degree in related subjects in the fields of Korean Language and Literature, History, Archeology, Philosophy and Ethics of 4-year universities.

B. The contents of Research

First, we explores the characteristics of career development and job preparation during the attending college of humanities graduates. To do this, we used the literature reviews, analysis panel data (Korean Education & Employment Panel: KEEP, Graduates Occupational Mobility Survey: GOMS) to explore the characteristics of each process such as selection of major in humanities, major education and career development, job preparation, and job search activities.

Second, we explores the barriers and success factors in career development and employment of the humanities majoring students. To this end, we were

interviewed (Focus Group Interview, in-depth interview) not only the heads of the college employment support services, but the graduates of humanities majors.

Third, we explore the jobs that humanities majoring students can be enter after graduation. To do this, we analyzed the results of the survey of new college graduates (Graduates Occupational Mobility Survey: GOMS), Employee survey (Korea Network for Occupations and Workers: KNOW).

Fourth, we suggest the specific policy plans for career development and job creation that the student of the humanities majors can active in their fields of majors after graduation. To do this, we conducted Delphi survey for experts and the results were analyzed.

2. Barriers and Success Factors of Career Development and Employment

A. Barriers Factors

In order to search for barriers factors of career development and employment of the humanities majoring students, FGI (Focus Group Interview) was conducted for humanities graduates, corporate HR managers, and college employment support departments. As a result, the barriers factors of Career Development and Employment were 5 areas: major, student, University, Social & Corporate, Government.

〈Barriers factors〉

Area	element	Factor
Major	Major characteristics	<ul style="list-style-type: none"> • Low practical • Low major-job conformity (job orientation) • Low majors-employment linkage
	Attitude of professor	<ul style="list-style-type: none"> • Professor's rigid and exclusive attitude • Lack of understanding of companies and labor market • Lack of support of student employment
	Curriculum and support of the department	<ul style="list-style-type: none"> • Curriculum far from social demand • Rigid curriculum management • Lack of ability to support employment (preparation) & lack of effort

Area	element	Factor
Student	Career beliefs	<ul style="list-style-type: none"> • Lack of confidence in the major • Parental influence (determine career based on parents' will)
	Career development	<ul style="list-style-type: none"> • Lack of self-exploration experience • Lack of career recognition (delay) • Lack of career development competencies
	job preparation	<ul style="list-style-type: none"> • Unrealistic employment aspirations • Lack of employment preparation & enthusiasm
university	Bachelor's degree system	<ul style="list-style-type: none"> • Lack of voluntary restructuring efforts by universities • Undergraduate system that does not provide opportunity for major exploration • Limits on the operation of the double major systems
	Customized programs	<ul style="list-style-type: none"> • Lack of development and operation of specialized programs in humanities • Poor program publicity & organic linkage
	Support organization	<ul style="list-style-type: none"> • Inadequate personnel expertise & manpower management system • Lack of management capability for companies & employment
Social & Corporate	Social awareness and demand	<ul style="list-style-type: none"> • Recognizing that humanities can easily be learned • Social trends where utility takes precedence • Lack of social demand & jobs
	Recruitment process	<ul style="list-style-type: none"> • Lack of opportunity to emphasize the strengths
	Manpower Selection Criteria	<ul style="list-style-type: none"> • Job-centered manpower selection (science and engineering center) • Personnel preference major setting (major in humanities disadvantage) • Prefer technicians who will put them on site immediately
Government	Jobs & job creation	<ul style="list-style-type: none"> • Lack of efforts to new job & job creation
	Delivery system	<ul style="list-style-type: none"> • Lack of delivery system to labor demand-supply
	Policy	<ul style="list-style-type: none"> • Lack of long-term employment support and academic upbringing policy

B. Success Factors

In order to search for success factors of career development and employment of the humanities majoring students, In-depth interviews was conducted for humanities graduates. As a result, the success factors of Career Development and Employment were 3 areas: Strengths of major, Individual preparation and effort, Support of school and department

〈Success Factors〉

Area	element	Factor
Strengths of major	Writing skills	<ul style="list-style-type: none"> • Writing for self-introduction
	Storytelling ability	<ul style="list-style-type: none"> • storytelling ability in the employment process for an job interviews • Personal story building and appeal
	Humanistic literacy	<ul style="list-style-type: none"> • Utilization of humanistic literacy in job performance
Individual preparation and effort	Major selection	<ul style="list-style-type: none"> • Choosing majors through sufficient thought and counseling • Choosing majors & subject to interest and aptitude
	Various activities for exploration	<ul style="list-style-type: none"> • Participation in various activities in and out campus • Various job experience including internship, on-the-job training
	Effort for career development	<ul style="list-style-type: none"> • Set career goals • Constant self-development & effort for career development • Pioneer an attractive story of his/her own
	Prepare for Employment	<ul style="list-style-type: none"> • Efforts to cultivate employability (language achievement, certification acquisition, etc.) • Participation in job club & engagement in job consulting
Support of school and department	Professor's guidance	<ul style="list-style-type: none"> • Professor's interest and advice on the student's career • Internships, on-the-job training, information on employment, referrals, etc.
	Utilization of human network	<ul style="list-style-type: none"> • Utilization of human network (alumni, school staff, etc.)
	Employment support	<ul style="list-style-type: none"> • Utilization of school employment support center & programs

3. Challenges for Career Development and Employment of Humanities Graduates

A. Major (Department) area

First, in order to overcome the difficulties caused by ‘rigid operation of curriculum for humanities major’ and ‘less difficult classes for practical skills’, students have to operate separate programs for comparative areas in addition to major courses. It is necessary to provide opportunities for the students of the liberal arts to cultivate their strengths by applying practical teaching and learning methods such as discussion and presentation class, presentation and discussion ability, and document and report writing ability applicable to the corporate reality.

Second, in order to overcome the difficulties faced by students due to the lack of capacity to support employment in the department of humanities (department), it is necessary to activate the career network of the majors by utilizing graduate alumni and professors’ networks that have entered various jobs and occupations. In addition, university-level support should be expanded so that departments can operate their own employment programs, such as linkage with related industries, qualifications required for employment, and support for social activities.

B. Individual Area

First, it is necessary to support students to form a broad view of themselves and their major by operating field study in the field of humanities so that students can overcome obstacles to career development and employment caused by lack of self-exploration experience. In order to improve the job skills of the humanities major, it is necessary to run a work experience program for the current students.

Second, it is required for student to take a course at the college of Humanities in order to overcome the obstacles to career development and employment caused by lack of career development competence of humanities major, lack of realistic employment, and a career search program. In addition, programs should be developed and operated to promote job motivation for all humanities students.

C. School Area

First, in order to improve the undergraduate system which does not provide opportunity for major search, it is necessary to expand the major convergence system. It is necessary to operate the school's flexible curriculum for the double major system such as quick support in accordance with the student's needs.

Second, in order to overcome the absence of customized career development and employment support program, it is necessary to operate a career development and employment support program based on the career path of the student, and various programs operated by the university, career and employment related information are provided sporadically.

Third, in order to overcome the lack of professionalism of career development and employment support organization, it is necessary to acquire specialized agencies and professional manpower to support college employment program and to expand business continuity of employment support department.

D. Society & Enterprise Area

First, in order to overcome the obstacles of eliminating the obstacles to the absence of opportunities for the students of humanities to exert their strengths in recruiting new recruits, companies are increasingly adopting a talented recruitment culture Should be improved. It is also necessary to establish a basis for evaluating the strengths of humanities graduates who create new values.

Second, in order to overcome obstacles to job shortage of major in humanities, it is necessary to acquire additional knowledge and skills in other fields, and to prepare for advancement and prepare for entry. And society and the government need to continuously develop their jobs related to the humanities major.

E. Government Area

First, it is necessary to support the government to create jobs and jobs related to humanities. For this purpose, the government needs to expand the history and cultural content business, or establish information on possible organizations that can enter the local humanities field and develop humanities jobs and jobs.

Second, a medium- and long-term human-related employment support policy is needed. It is necessary to provide a job improvement program so that

humanities graduates can develop relatively weak competencies. It should also provide opportunities for exploring businesses and jobs in various ways during their school years. In addition, the evaluation method for university financial support needs to be shifted from the focus on employment results to the way of evaluating student career development and employment support plan and support capability of universities.

〈Career Development and Employment Activation of Humanities Graduates〉

Challenges	Policies
Jobs and job development that can be handled by humanities graduates	<ul style="list-style-type: none"> • Expand the range of job opportunities available to humanities graduates • Job development for graduates of humanities: operation of “Start-up project manager” system
Developing programs for career & competency development for the humanities major	<ul style="list-style-type: none"> • Developing career & job preparation program for the humanities major • Developing competency development program for the humanities major
Job experience program and system operation for the major subject of humanities	<ul style="list-style-type: none"> • Operate a job experience program for the humanities major • Practical experience opportunity through on-the-job training • Integrated systems of non-curriculum in university • Enhance the professionalism of career development & employment support personnel in universities
Improving the university’s academic system	<ul style="list-style-type: none"> • Improvement of major classes in humanities • Improving the university’s academic system
Improving student career development support system	<ul style="list-style-type: none"> • Improvement of the guidance for entering university • Opening of the society advance committee of the humanities major

Research on Korean Occupational Index for Employment Service(2016)

Hyun-jin Jang, Cheon-soo Park, Hea-jun Yoon,
Dong-man Na, Min-wook Lee

The present study aims to build a framework for developing the Korean Occupational Index (KOI) and ultimately seeks to provide valid occupational information to support career choices by investigating conditions and prospects of occupations in the context of Korea. The KOI was created not only to provide useful information for job seekers and current workers for supporting their job selection and career development, but also to offer job experts with valid data for their study by investigating attributes of occupations.

As the first wave of the project which is a part of 10 year research from 2016 to 2025), this study was proceeded in the following stages. First, we built a framework for the KOI development based on the comprehensive literature review. Next, we revised and elaborated the index after conducting two Delphi surveys of which we invited 55 experts in job, employment, and career development. Then, we conducted a web-based survey on occupational index (3,500 workers in 70 occupations participated in the survey) and analyzed the results of the survey. Along with the web-based survey, the FGI, participated by relevant experts of major occupations, was used as an important way to complement and interpret survey results.

The content of newly developed KOI items involved eight areas including entry qualifications and requirements for employment, job characteristics, job competency, working conditions, income, employment stability, job prospects, and occupational value. These areas reflect occupations' nature of job, key tasks, work environments, social status. In addition to the basic analysis of the index results, we also examined six key issues: 1) employment requirements and stability, 2) key factors affecting occupational satisfaction, 3) work-life balance, 4) employees' leisure and quality of life, 5) the present and future of desired

occupations in the adolescent and youth, and 6) a customized occupational index for women and elders. Furthermore, this study suggests several policy recommendations to enhance better career choice, job transitions, career development, and individual well-being.

A study on a Koreanized link model between industrial development and vocational education and training

Taejoun Park, Yoomi Son, Jaesik Jun

This study aims to investigate and suggest the relationship between South Korea's education development and economic growth. The relationship between South Korea's education development and economic growth to a lot of attention, which has been in many developing countries in the process of transmitting. The key elements of industrial development and vocational education and training of ways to connect. However, analyzing the correlation between education and industrial development does not exist. It is necessary to discuss the new model of relationship between Korea's economic stage of development, vocational education and training in the analysis in some relationships with industrial development and international development cooperation to developing countries in this relationship. To sum up this study as follows :

South Korea's economy begins to enter drastic development process since the 1960s when leading role in the Korean economy was in charge of the manufacturing sector. Although in charge of overall economy was still lower than the primary level, and began field produced the development of technology to rely on labor-intensive. Industries stay around a quarter of total exports in the early 1960s, manufacturing is by playing a role at least 90 % of total exports in the early 1970s. In terms of foreign exchange transactions, started to play the role of leading the Korean economy.

Critics at home and abroad still ahead would develop heavy and chemical industries of the government is the nation's industrial structure, but left up another level now, and the role. Most industries are laying the basement the development of and supposing the Korean economy.

Vocational school and vocational training system the 1960s and '70s, maintenance process is in light industry in the centre of the industrial structure to keep in step in changing policies in industrial structure in the center of heavy

and chemical industries. Transformed into a form that can be seen that to respond. After policy changes in setting economic policy for vocational school or vocational training system less hurt than in the form of the opposite.

A Case Study of Government-Funded Vocational Training Programs Based on National Competency Standards(NCS) in South Korea

Sookyoung Lee, Young-Sun Ra, Ji-Young Ryu

The purpose of the research was to analyze the current status of vocational training operations supported by the government based on National Competency Standards (NCS).

In particular, a case study of ten vocational training institutes was conducted as part of the main research methodology in order to identify the impact of NCS on the operational elements and stages of vocation training. In the case study, we focused on human factors, material factors, and program factors in terms of operational elements. In the aspect of operational stage, the research mainly emphasized ‘course development’, ‘trainee recruitment and selection’, ‘class operation(teaching and learning phase)’, and ‘job guidance’.

To complement the case studies, a survey questionnaire was applied to vocational training institutes that participated in national core strategic industry occupational training in 2015. 402 of the 460 institutions participated in the survey, and the response rate was 87.4%.

The major results of this study are as follows. ‘course development’, ‘trainee recruitment and selection’,

While the interest, investment, and effort of the stages of ‘trainee recruitment and selection’, ‘class operation’ phase increased, ‘course development’ and ‘job guidance’ decreased. Although the increase in investment and efforts of vocation training institutes has been prominent in the class operation(teaching-learning stage), it is not a positive situation to see if the actual situation is clear. Unfortunately, it was confirmed that the simple administrative work increased without investment and effort in the regular classroom operation. Rather, the supplementary classes have increased dramatically in the stage of classroom

operation. This is because the NCS-based training programs is limited in reflecting the needs of trainees and companies. The training institute pay for its own expenses and organize separate programs. It was confirmed that the operation cost of the supplementary class was borne by the training institution. Despite the increase in government expenditure support after the introduction of the NCS based training courses, it was recognized that the increased administrative costs and operating costs of the supplementary classes were acting as difficulties in the management of training institutions.

Through this study, it was found that acceptance and perception of NCS policy of trainees and corporations is very low compared to training institutes. The low acceptance of the NCS policy in the field of vocational training has a negative impact on the quality and performance of vocational training operations. In order to enhance the performance of NCS vocational training, it is necessary to increase the acceptance of NCS policy of trainees and companies, and it is necessary to pursue vocational training policy in accordance with the speed of acceptance of NCS policy of trainees and corporations.

The Actual State and Task of Vocational Education and Training(VET) for Part-time Jobs

Hye-Won Ko, Ji-eun Lee, Ji-Min Nam

Since 2013, policies governing part-time jobs have been carried out to meet the various needs of workers including work-life balance, learning, and retirement preparation. This study aims to provide suggestions for the implementation and expansion of vocational education and training to improve the quality of part-time jobs by analyzing the actual state of government-supported VET for part-time employees from the perspectives of creating quality part-time jobs and better jobs through part-time employment.

The study revealed that part-time employees and their employers have difficulty in appropriating time for VET compared to full-time workers. In response to questions regarding the various systems for part-time workers at private companies and public organizations including “job transfer,” “VET,” “performance appraisal,” “promotion,” and “welfare benefit” schemes, the largest number of respondents answered that they do not run a “VET program for part-time employees. Another survey on the difficulty in preparing VET for part-time workers, both private and public entities experienced difficulties in scheduling VET classes due to the differing working schedules of part-time employees.

Since part-time workers must undertake the same VET as their full-time counterparts, they cannot have training during their working hours, but must instead follow full-time workers’ training schedules. If part-time workers saw such training as a prospect for development, they could invest more in VET. From this point of view, VET could be considered an essential element in improving the quality of part-time jobs.

Based on these studies, the following suggestions can be made for the improvement of VET for part-time workers.

First, in order to awaken attention within companies regarding VET for part-time employees, non-discrimination between full-time and part-time workers should be stated and implemented.

Second, it is necessary to develop VET programs that satisfy the characteristics of part-time employees at small and medium-sized enterprises (SMEs).

Third, in the case of part-time employment, a ladder for upgrade and promotion should be developed to allow part-timer employees to develop their careers and have hope for better working conditions.

Fourth, VET that caters to the working hours of part-timer workers is needed.

Fifth, as seen in the European experience, part-time work should truly be classified as a “job” only when one can work at least 20 hours a week.

Sixth, in order to allow workers to choose jobs and develop their careers through VET under part-time employment, it is necessary to induce employers to increase spending on labor and to reduce government assistance to businesses hiring part-time workers.

Evaluation of Trainees' Competency in National Competency Standards Based Government-Funded Training Programs in South Korea: Current Status and Suggestions

Joohee Chang, Hanna Moon, Soorin Yoon

As a part of a major government project of building infrastructure for the Competency-Oriented Society, National Competency Standards (NCS) began to be applied to government-funded training programs throughout the entire process of analysis, design, development, implementation, and evaluation since 2015. In the NCS-based training programs, there is emphasis on the evaluation of trainees' competency.

The purpose of this study was to explore the current status of evaluation of trainees' competency in government-funded NCS-based training programs in South Korea, and to make suggestions for its proliferation. Two surveys were conducted and 275 trainers and 33 professors of 33 two to three year colleges responded. Two case studies and three Focus-Group-Interviews were conducted.

The Korean government should provide clear policy guidelines for evaluation of trainees' NCS-based training programs. Success cases of NCS-based trainees' evaluations should be accumulated and disseminated. The process of evaluation can be more efficient, if training institutes use IT systems. The Ministry of Employment and Labor must provide more training programs for the trainers so that they can better understand NCS, NCS-based instructional design, and evaluation. The Korean government should also consider adopting systems to train and develop professionals in the field of job evaluation similar to competency assessors in Australia.

An Analysis of Labor Market Adaptation Status and Landing Outcome of Apprentices

Seung-Hwan JEON, Sung-Su HWANG, Dae-Young KIM,
Han-Byul LEE, Dong-Yul JUNG

This research aims to analyse labor market adaptation status and landing outcome of apprentices. Based on this, it tries to provide policy suggestions for apprentices' better adaption and soft landing on the labor market. This research mainly uses the methods of literature review, survey, Focus Group Interview (FGI), expert meeting, and seminar.

There are 7 main results in regard to labor market adaptation and 5 main results related to labor market landing outcome as below.

1) Labor market adaptation status of apprentices

- The level of apprentices' adaptation to organization and job duty has positive correlation with the level of organizational support to apprentices.
- It is important to provide apprentices with mentoring with an in-company trainer and give them opportunities to make suggestions for their adaptation to organization and duty.
- If on-the-job training is led by an in-company trainer based on job duty on industrial site, job application possibilities and job performing abilities becomes higher.
- If on-the-job and off-the-job training are systematically related focusing on job duty, job application possibilities and job performing abilities becomes higher.
- It is significant to use OJT learning tools related with job duty for the improvement of job application possibilities and job performing abilities.
- If systematic evaluation and feedback in regard to learning results is conducted, job application possibilities and job performing abilities becomes higher.

- The system of objectively evaluating the level of the improvement of apprentices' job performing abilities does not exist yet.

2) Labor market landing outcome of apprentices

- Giving excessive amount and level of duty to apprentices, who have to do learning and working at the same time, may be a hindrance factor to being observed in their duty and career.
- It is important to provide apprentices with obvious vision and development possibility in order to reinforce their immersion in organization and duty.
- The higher their payment level is, the higher the level of satisfaction with and immersion in organization, duty, and career and the will of continuous service.
- Apprentices are fully aware of overall work-learning dual system, while their level of understanding their treatment, working condition, and procedure and way of internal and external evaluation is relatively low.
- The will of continuous service of 20s is relatively lower than that of 30s or 40s.

Based on the main results mentioned above, the research provides 13 policy suggestions.

Task1: Establishing learning-friendly organization culture at the company level for supporting apprentices' adaptation

Task2: Listening to apprentices' opinion and difficulties through regular mentoring with in-company trainers

Task3: Spreading on-the-job training focusing on job duty

Task4: Reinforcing systematic linkage of on-the-job and off-the-job training based on job duty

Task5: Proliferating the use of OJT learning tools related to job duty at the company

Task6: Vitalizing internal and external evaluation

Task7: Elaborating and disseminating evaluation tools of job performing abilities

Task8: Providing appropriate duty with the consideration of apprentices' educational background and skill level

- Task9: Developing and disseminating sectoral career development path and best practices
- Task10: Providing apprentices with rational level of treatment(payment and welfare)
- Task11: Reinforcing preliminary guidance of work-learning dual system
- Task12: Good matching of apprentices and companies considering apprentices' talent and aptitude
- Task13: Providing additional incentive to apprenticeship completers

Progress on the Initiation of the NCS-based Vocational Education and Training Policies & Future Suggestions

Hyang-Jin Jung, Bom-I Kim, Ji-Young Kim,
Hyun-Soo Kim, Cheol-Woo Park

Now is the time when the overall understanding and monitoring of the progress on the initiation of the policy projects is required, owing to the following reasons: a liaison between the policies when in the process of developing·applying·expanding NCS, the efficiency of the maintenance·support on their related projects, and lastly, improving the usability of the outcome. In particular, it proves its significance to collect·analyze all documents about the related policy projects from the last three years of carefully studied data ever since the year of 2013, - despite it being a short period of time - to examine the meaningful result and its overall effect, and to make future suggestions on the application of the policies in the industrial field, quality management, and of the vocational education and training.

In the following research: 1. We have collected·analyzed all documents about the NCS-based Vocational Education and Training Policies in order to complete a base case analysis on the characteristics, targeting audience, types, liaison with other policy projects, total budget, main managing agent, and promotion system of the policy, and have finished monitoring the group of experts in connection with the outcome. 2. We have offered future suggestions on the retainability of the NCS-based Vocational Education and Training Policy Projects and the improvement on the service for the prospective beneficiaries of the policy.

The outcome of the following research covers: 1. Plans on integrated development of demand base qualifications in the industrial world, NCS, and learning modules. 2. Quality management on the NCS-based Vocational Education and Training & Plans on establishing its reflux system. 3. Assessment on the achievement of the NCS-based Vocational Education and Training &

Plans on financial support. 4. Suggestions on the policy projects such as the establishment of governance of the NCS-based Vocational Education and Training and future strategies.

Transformation and Prospects of Vocational Education and Training Policies at the 70th Year of Independence

Park Dong Yeol, Lee Mu Keun, Sang-jin Ma

I. Research Background

South Korea achieved remarkable economic growth especially during the last half century after gaining independence. As a result, Korea is developing as country, it has progressed from being a recipient of ODA 20 years ago to becoming a donor in the present day. Indeed, vocational education and training policies hugely contributed to the economic growth of South Korea. Vocational education and training policies of South Korea are even acknowledged by developing countries as a successful policy role model. However, despite this achievement, a comprehensive framework for the assessment of vocational education and training policies has not yet been developed. Moreover, vocational education and training policies are inconsistently enforced due to policy changes when the government changes according to their administrative vision. Therefore, in this research, the transformation of vocational education and training policies and its implications for the future policy development are explored. In the conclusion of this research, the future direction and strategies of promoting vocational education and training policies are presented.

II. Analysis on Vocational Education and Training Policies

In this research, the transformation of vocational education and training policies in South Korea has been analyzed using three criteria: 1) administration time, 2) each stage of making a decision, implementation and assessment of policy, 3) area of vocational education and training policies including schools, classes as well as contents of each policy.

The analysis results show that vocational education has to pursue the vision of creating a competency based society, social contributions, and individual achievements. Based on these analysis results, I presented the core vision of vocational education is creating a competency based society through vocational education and training policies.

In this research, I also presented five success factors of Korean vocational education and training policies in the following order: a centralized governance for policy implementation; will of beneficiaries and changes in their understandings of vocational education and training; communication and feedback on management and outcome of vocational training; policy implementations in considering social changes; and policy introductions and linkages.

In conclusion, nine key issues of the improvement of vocational education and training policies in the process of establishment, implementation and assessment were recommended: increasing awareness of vocational education and training policies in the society (42.1%); increasing activeness and learning outcomes in the vocational education field (31.6%); reducing confusion emerged from imprudent policy implementations (26.3%), establishing medium- and long-term policy plans (26.3%); building a sufficient cooperation system between related ministries (21.1%); increasing understandings of field-level managers on the policies (21.1%); securing funding (15.8%); increasing the sufficiency of the quality management system (15.8%); and reflecting social changes in the policies (15.8%).

III. Analysis Results and Implications

1. Analysis Results of Vocational Education and Training Policies

First, vocational education and training policies of South Korea are closely related to social and economic environment changes. For example, the Park Chung-hee administration established a policy that increases the number of students attending vocational high schools as soon as demand rises for skilled and technical professionals. As a result, the government expanded financial support for vocational education, and established the Industrial Education Promotion Act for building infrastructure for expanding vocational education.

Second, the objectives of vocational education policies have been changed to the “realization of a competency based society” from the “national economic

growth through training human resources.” Until the Roh Tae-woo administration after the independence, the objectives of vocational education policies were focused on improvement of competitiveness of the nation and enterprises through training human resources. On the other hand, after the Kim Young-sam administration, the Korean government has been pursuing the realization of a competency based society which can forge a path of success through vocational education by reflecting not only the nation or businesses, but also individuals’ needs and aptitudes.

Third, the main success factors of Korean vocational education and training policies can be summarized to four factors: the efficiency of policy implementation governance; the flexibility of policy implementation within social changes; the short-term effectiveness of policy implementation; and the sustainability and consistency of policies. Korean vocational education and training policies are successful in terms of establishing a comprehensive plan for vocational education at the central-government level considering the need of the labor market and changes of industrial structure. The central government also sets the core goals to achieve in each level of policy implementations and strongly encourages achieving these policy goals. In addition, the central government continuously promotes the best policies implemented in the past. The current vocational education and training policies such as the expansion of the number of vocational middle school students, promoting the work-study dual system (dual apprenticeships policy), emphasizing NCS based curriculums, and establishing the Technology Officer Training Program for Small and Medium Business are examples of policies rooted in previous successful policies.

2. Directions and Implications for Future Vocational Education and Training Policies

The vision of vocational education and training – ‘contributing to the realization of a competency based society which can forge a path of success through vocational education’ – can be achieved by re-defining the role of vocational education organizations.

First, vocational education organizations are expected to perform the leading role in integrating general and vocational education as well as in providing vocational education in both general high schools and universities. For example, the experiences of managing customized training programs at vocational colleges

and substantializing professional education in specialized vocational high schools are closely linked to the policy promoting industry-university collaboration as well as running vocational courses at general high schools. Therefore, vocational education organizations have to provide opportunities of participation of general education in vocational education while pursuing substantiality and practicality of vocational education.

Second, vocational education organizations are encouraged to perform the role in overcoming vocational prejudice. In the past, vocational education had a stigma as 'second-class' education. However, vocational education is building its own identity and status as soon as the effects of higher education on social mobility are decreasing. Nonetheless, the public image of vocational education is still negative which is also related to vocational prejudice. Therefore, vocational education organizations need to intensify its efforts to overcome vocational prejudice as well as raise its status as leading educational organizations that contribute to realizing a competency based society through public relations.

Third, vocational education organizations are also expected to perform the role in forging a path of success through vocational education, not through a general path of high school-university graduation. The role of vocational education organizations in creating a new path of success is needed especially for marginalized middle and high school students who are the majority attending vocational schools in Korea.

Fourth, the Korean system of utilizing and promoting technical professions is locked in a vicious circle and it has to be transformed to a virtuous circle. For example, preconceptions and prejudices against vocational career influence vocational students to remain in marginalized social and economic conditions. Marginalized social and economic conditions given to vocational occupations also influence students to avoid to have technical or skilled occupations. As a result, foreign employees are allocated to low-skilled jobs in order to fill up domestic workers' positions. As foreign employees are getting employed for long-term, their competency and competitiveness also increase. Consequently, domestic skilled workers participate in low added-value work, and moreover compete with foreign workers. Therefore, vocational education organizations should contribute to transforming the vicious circle to the virtuous circle by providing competency-based education or NCS education for improving skills of students.

In conclusion, I propose four key issues of the improvement of future vocational education and training policies. First, the Korean educational system needs to be reformed to construct future directed programs. Second, surplus classrooms and teachers, as results of the decline in birth rates and the aging society, can be used as nursery and childcare facilities, and can be placed in nursery. Third, the contents of school education need to be reorganized for the systematization of learning experiences outside the classroom. Fourth, the transformation of policies on the utilization of foreign employees is necessary as the Korean society is becoming multi-cultural.

Analysis on outcome and construction of product innovation system in R&D for Vocational competency Development

Hea Jung Chang, Su-won Kim, Young sang Kim

This research aims to analyse outcome and construction of product innovation system in R&D (Research & Development) for Vocational Competency Development. As a part of major government project of building infrastructure for the Competency-Oriented Society. Based on this, it tries to provide policy suggestions for outcome management in R&D for Vocational competency development, especially for national research institutes for Economics, Humanities and Social Sciences.

This research mainly uses the methods of literature review, survey, Focus Group Interview(FGI), expert meeting, simulation, and seminar.

There are 4 main results in regard to research institute adaptation and 3 policy suggestions related to promote R&D outcome as follows.

First, we analyze the problem of the status and characteristics of national R&D program and policy.

Second, we suggest the analysis standards and method for the efficient and systematic evaluation of national R&D management.

Third, we propose the use of a pool of performance index and KPI(Key Performance Indicator) for improving performance analysis model to innovate in quality management for R&D.

Finally, to the final development through the validation pilot test for application. Although outcome evaluation model, various models, depending on the approach, the present study was to utilize the pool for performance index(consist of over 200 items) which is developed in this study.

Based on the main results mentioned above, the research provides 3 policy suggestions.

First, we suggest the alternatives of current method of self-directed outcome management for each R&D institutions.

Second, enhancement of efficiency of work and feedback by PREF product innovation system.

Finally, establishing an integrated outcome management and operation organization nationally for R&D institutions regardless of Science and Technology, Economics, Humanities and Social Sciences.

Activation of Collective Learning Network to Strengthen Artificial Intelligence Fusion Technology

Young Saing Kim

Artificial intelligence and convergence technology is a core competence that determines the core competitiveness of the 4th industrial revolution. Although the interest has increased since the Alpha Go event, the level of technology, experts, investment and infrastructure are insufficient.

Artificial intelligence, led by smart technology, has emerged as the core of national competitiveness in the 4th Industrial Revolution, as artificial intelligence that learns by itself and IOT, cloud, and big data are combined and developed rapidly.

The most important characteristics of the artificial intelligence and its application are the results of a learning network that occurs within the industrial ecosystem of many researchers and companies, not individuals or individual institutions. Therefore, in order to develop artificial intelligence, it is necessary to strengthen learning network that can activate group learning. The robustness of the industrial ecosystem that supports this will determine the competitiveness of the industrial structure.

A single star company decides its overall competitiveness, that is, the hierarchical integration strategy led by large companies is no longer easy to remember. Development of artificial intelligence network provides opportunities for many technology start-ups and job creation. The domestic artificial intelligence specialists and start-ups have considerable capabilities. Universities and research institutes are also recognized in the field, but professional workers and start-ups are not networked and develop into new businesses or programs. Therefore, Collective learning based on network is a driving force that facilitates the development of various business opportunities and product development based on the cooperation of experts and companies with various competencies.

Group learning networks of artificial intelligence related technology are

defined as a concept that includes knowledge creation and dissemination, inter-organizational network, and innovation activities outside the company for activities in which connected professionals and companies create new value. These diverse professional and corporate networks are mainly used to develop ideas to be realized in the lean process and value chain, to create and segment customers. In order for lean processes to work smoothly through such group learning, an ecosystem supporting this can be established. This horizontal network ecosystem is located at a point opposite to the hierarchical integration of pyramid shaped subcontracts

As a healthy ecosystem is built, group learning becomes possible, and various experts and corporations can truly collaborate for open innovation. As a result, new products, new processes, start-ups, and system innovation, Silicon Valley, is a representative example of ecosystem built by these technology leaders. From early on, Silicon Valley has established a natural ecosystem based on building an ecosystem, so universities, research institutes, large corporations, start-ups and various specialists are connected in a network form and the melting pot of the capacity is greatly activated. Ecosystem-based group learning is incompatible with the pyramid-type subcontracting organization of the domestic manufacturing industry. Individual and start-ups, as well as SMEs and large corporations, have the same context as the model of win-win or symbiosis for the development of the whole ecosystem.

Objectives

- Review domestic and foreign artificial intelligence industry, analyzing data related to artificial intelligence development strategy by country, and analyzing support policy data related to artificial intelligence
- Identify ecosystem and collective learning cases by investigating domestic start-ups and technology founders or related experts
- Organize an ecosystem and build a group learning network by working on domestic artificial intelligence experts and corporate panels to discuss ways to activate start-ups and collect opinions
- Investigate artificial intelligence related technology start-up entrepreneurs, accelerator supporting such entrepreneurs, and clusters focused on technology companies

- Overseas case study of major countries, field survey
 - Investigate the case of artificial intelligence industry ecosystem and group learning networks.

The artificial intelligence of the Silicon Valley, a major US artificial intelligence research center, and major corporations such as the Google autonomous drive vehicle and Tesla Auto Pilot, has evolved into an open source platform such as a tensor flow, and is building an artificial intelligence research complex.
 - Aim to develop a model that can be applied to the domestic Pangyo Techno Valley through case studies of Silicon Valley companies and institutions related to artificial intelligence.

Results

- Pros and cons of Domestic Group Learning Network
 - Industrial parks, science parks, and business park development projects related to technology start-ups or start-ups that are promoted by government policies are mostly focused on providing good space, so that they do not consider establishing a group learning network or realize the necessity of realizing it. Inadequate
 - Technological innovation startups like Silicon Valley need to build industrial parks that are suitable for building cooperative networks. Pangyo Techno Valley has secured physical access but failed to build a group learning network
 - Cooperation for most start-ups or start-ups is limited to colleagues who work in the same workplace, not private colleges or graduate alumni
 - Social capital is confined to individual collectivism, and if it is not a private relationship such as a school, it is not active or limited to a network structure capable of group learning aimed at start-up.
 - It is difficult for entrepreneurs to utilize various capabilities and resources needed for innovative start-up or development because research institutes, schools, corporations and individuals are not connected to networks. Accelerators are also trying to form networks, but they are limited to utilization of internal resources.

- Direction for building a group learning network
 - Establishment of infrastructure and business plan that realizes this by focusing on strengthening group learning network, and it is important for research and development and start-up support project to be focused on S / W centered on H / W
 - In order to be competitive, it is necessary to integrate immigration policy and entrepreneurship programs that allow various forms of employment, acceptance of cultural diversity to collect diverse and excellent global talent, not to focus on domestic personnel.
 - Voluntary participation of companies is more important, for example, by spreading the organizational culture of enterprises into an innovative start-up culture emphasizing function- oriented horizontal and lifelong ability development.
 - Collaboration of higher education institutions with network membership that combines capability development and extreme networking to build social trust, a component of the group learning network.
 - Successful entrepreneurs actively act as accelerators to build a virtuous ring of entrepreneurial ecosystem that leads investment as well as role model of the preparer

- Strategy for building a group learning network in Innovation Valley
 - Pangyo Techno Valley has succeeded in physical clustering of related companies by benchmarking successful innovation hubs such as Silicon Valley. However, the establishment of a group learning network among companies has failed half the success
 - The innovation valley should be planned to build a group learning network with physical clustering. However, when social trust is small and lacks competence information of individuals and companies, there is a need for selective and intensive strategies
 - Provide differentiated incentives based on aggressive networking participation to select the subjects that participate in the innovation valley that agrees with high participation and high achievement, and establishes governance to lead major regulatory and management
 - Provide global innovation hubs, information disclosure, and incentives for internationally competent personnel to start up in Korea to network with

domestic and overseas experts and companies in connection with overseas innovation valley.

- The main concepts and contents of the group learning network need to present the direction of the implementation plan for the specific situation or business. Therefore, the conclusion and implications of this study are centered on the way to build a group learning ecosystem of the 2nd Pangyo Techno Valley or e-valley which is promoted by the government.

Conclusion and Policy suggestions

- The government is proposing the establishment of an innovation hub as a basic plan for sustainable economic development and job creation
 - Pangyo Techno Valley was started by Gyeonggi Province and led by the Ministry of Industry in order to create clusters of technological enterprises to achieve integration effect.
 - Although it has accomplished significant achievements in securing the necessary space for notifying the technology companies, it has not been enough to build network by focusing on physical space and to activate group learning. It's next to me, but there is no networking.
 - There was a limit to the effective cooperation of the government at the government level with the business centered on the local government. Therefore, a project to create Korean technology venture and start-up cluster by benchmarking Silicon Valley was planned.
 - In the key areas of the 4th industrial revolution, domestic companies are not able to show their prominence and the preemption of US and Chinese companies is deepening. This project is important for future national competitiveness and securing of growth engine.
- Concept and main characteristics of e-valley
 - The concept of this project is to secure the physical, social and technological space to feel and experience various forms of 'Freedom' that maximize creativity and imagination from 'life environment'.
 - Increase the flexibility of securing space according to the growth of start-up and consider the space arrangement and utilization that various services required for start-up (law, accounting, marketing, HR, etc.)

- Added the duty to start-up so that the start-up can not be occupied because of the expensive rent, and on the contrary, the additional burden due to the occupancy is reduced. Also, in order to secure a convenient and cheap residential area, it is necessary to establish a housing supply plan based on the time of commuting based on the residence, and to consider the pre-sale control and the family rest space.
 - In order to distribute development profits due to the construction of industrial complexes and innovative hubs, the legal system to make the development profits return to start-ups rather than developers
 - Make room for start-up and space for various attempts. In other words, by making mandatory startup space for the core three levels ten years, the Innovation Hub has made space for start-up sustainable.
 - An important role of the university in innovation valley like Stanford University in Silicon Valley. In order for the university to strengthen its networking, it needs to support alumni companies, technical holding companies, general meetings, and ILP business-related duties, and consortiums of universities and companies
 - Establishing space for foreign companies and aiming to attract 500 technical start-ups and venture companies. Foreign companies establish plans for providing administrative support and services necessary for domestic settlement, and implement plans to attract foreign start-ups.
- Demand analysis results show that the cooperative network and group learning ecosystem are emphasized.
- Demand for networking and group learning in the demand survey for business was strong. Especially, we need to secure a co-working space for start-up and to expand the connection with existing venture campus.
 - By further subdividing networking needs, we are encouraging Corporate Venturing (CV), which is the result of a group learning network, and expecting cooperation with Corporate Venture Capital (CVC) to be the most necessary network result. CV is a collaborative effort between companies that have acquired technology and business opportunities, and expectations for networking's typical expectations are high.
 - There is also a need to revitalize communities where venture companies and start-ups that need cooperation can meet and exchange information and create a lot of activities.

- Designing for organic connection of collaborative spaces to design physical spaces and building circles and shared facilities to reflect these networking and group learning ecosystem needs.
- Major tasks for activation of group learning network
 - Demonstration of the network in demand analysis is a business model in Silicon Valley where 'Founder - VC - Cooperating Company' cooperates to start commissioning. These results can be obtained when the key participants are socially involved, competent, and able to share and efficiently utilize resources in order to obtain the results of such networking.
 - Establish strong network membership by confirming the willingness and ability to participate in the project when participating in the business, so that both the company and the founder who participated in the business should have the level of the collaborative relationship and have appropriate trust, competence and entrepreneurship.
 - Network participation contracts and incentive schemes linking expected revenues and networking participation in business are required to actively participate in networking and lead to new opportunities.
 - If foreign labor force is needed, visa, tax and immigration regulations should be reorganized so that excellent manpower can flock to the world and become the most desirable innovation hub.
- Implementation plan of learning network
 - To establish a new school and to establish a trust relationship, e-valley membership (citizenship) course completion (minimum 400 hours) is obliged to participate in the project. Participants experience extreme cooperation and collaboration and start up And establishing a business plan, horizontal organizational culture, and so on. Participant selection effect for raising the value of real estate, can not move in case of failure
 - Operate competency and records management system to disclose practical information on competency, business experience and work related information, activate the system of competence and recruiting, and activate the competence market.
 - Consider the higher-level credit system that can be used to distribute networking participation, especially contributions, as social money, to use

them as money in e-valley, and to distribute resources and opportunities that have significant competition.

- Ensure high commitment and high rewards by declaring e-valley Nation and operating the citizenship system to clarify obligations and rights under citizenship. Also, when utilizing foreign nationals
- “The e-valley Nation” autonomous government is constituted by the citizens who have citizenship through a democratic process and established an internal legal system for major issues. It is critical to ensure a certain level of autonomy in regulation, such as Silicon Valley. 20% New Citizenship and Citizenship Deprivation by Reexamination of Citizenship in 3 Years

Study on the Management and Operation of Korean Qualifications Framework

Choi Young Real, Jung Ji Un, Lee Yu Jin

This study aims to provide directions on management and operation of “KQF(Korean Qualifications Framework)”. This study sets up theoretical framework utilizing research papers published in Korea and Foreign countries related to NQF and KQF. Based on the framework, demand survey was conducted on each elements found in the framework. 90 experts in education, qualification participated in the survey. The survey results were analyzed via expert meetings using Focus Group Interview to find out the meaning of the them.

The finding of this study are follows;

- Government should take enough time to implement KQF,
- KQF should enable to reform education, labor market, society, and cultural system in the long run,
- Decision making on KQF management and operation should be made from bottom to top method,
- KQF management and operation should invite private-public partnership method,
- KQF management and operation should be on one leading government agency and implementation agencies should be combined to one,
- KQF should have separate Act or included in “Basic Qualification Act” after revision, and
- Elements needed to operate and manage KQF should be implemented according to the importance and urgency showed on the survey.

A Study on Strengthening the roles of CCEI through the Collaboration of Regional Universities

Tong Park, Il-Gue Kang, Ji-Sun Chung

1. Outline of Research

This study aims to explore practical measures to cultivate creative makers who can lead the development of new industries and the re-takeoff of existing manufacturing industries through the collaboration between Center for Creative Economy and Innovation(CCEI) and regional universities under the conditions of acceleration of the fourth industrial revolution. To this end, we tried to find sustainable development ways after we reviewed the roles and functions of existing CCEI. In particular, we sought various ways to activate a new entrepreneurship model which could lessen the costs of starting an innovative business and the risks of failure.

According to the above research purposes, the following matters were analyzed.

First, the concepts of creative economy and the fourth industrial revolution were defined, and then we inquired the components of a maker ecosystem such as a maker movements, maker spaces, maker fairs etc.

Second, the existing situations and problems of CCEI were analyzed. Especially we focused on the connection between CCEI and regional universities.

Third, through a questionnaire survey, the actual conditions of CCEI, the CCEI's role as a hub apparatus of youth startups and the performance of CCEI as a maker space were analyzed.

Fourth, maker startup ecosystems of main countries were analyzed and several implications were derived. We especially focused on Techshop in USA, Maker Space in Germany and Maker Space in China.

Finally, several policy suggestions to strengthen the roles of CCEI were presented.

2. Main Findings

In this study we conducted a questionnaire survey and convened conferences of entrepreneurship experts where we drew some important findings.

First, it turned out that the most of the experts of university startups didn't utilize CCEI. Therefore in order for CCEI to develop continually it was needed to make all kinds of efforts to induce university experts to visit and utilise CCEI.

Second, there existed a wide interpretation gap between the regional startup experts and the university startup experts in evaluating CCEI's performance. Generally regional experts tend to be very positive. On the contrary university experts generally evaluated CCEI's role very negatively.

Third, the bilateral cooperation between regional universities and CCEI has been at a low ebb. In particular the university experts' responses were very negative.

Fourth, it has been confirmed that CCEI couldn't play an active role as a hub apparatus of youth startups. Regional experts evaluated the CCEI's role very positively, whereas university experts evaluated it very negatively.

Fifth, it was confirmed that CCEI couldn't play a supportive role in the maker movement. Especially it didn't supply people with enough tools to make something new and useful.

Finally, it proved that entrepreneurship education, maker space, maker tools and networks had very strong impact on the collaboration between CCEI and regional universities.

3. Policy Recommendations

Based on the main findings of this study, we suggested several policy recommendations.

First, the locations of CCEI should be changed and CCEI should re-identify its role as the regional hub of youth startups. In response to the demands of the fourth industrial revolution, it is necessary to activate the collaboration between CCEI and regional universities. Also to re-identify the CCEI's role as a core apparatus of regional innovation and youth startups, the differentiation of CCEI's function is essential.

Second, to strengthen the roles of CCEI, it is necessary to transform CCEI into regional maker space. In Korea, there are numerous small maker spaces. But the

use rate of those spaces is very low and the most of maker spaces are open only while the government officials are on duty

Third, to cultivate the professional makers, it is also essential to create maker spaces within the universities. To build a maker space, it is necessary to make use of government's financial support to university.

Fourth, it is needed to strengthen the link between the maker movement and youth startups. In Korea, absolute majority of maker spaces have no creative communities which can provide the users with all kinds of startup items and professional knowledge and experiences.

Fifth, the connection of entrepreneurship education between CCEI and regional universities should be reinforced. In Korean universities, most of the entrepreneurship educations tend to place more importance on theoretical lectures instead of actual experiences.

Finally, it is very important to promote youth startups through global networks. Nowadays youth startups are not limited within the boundary of one nation. So it is needed to strengthen the global collaboration in the early stage of entrepreneurship.

The Trend Analysis of National Competency Standard Policy Development in Major Countries

Hanna Moon, Daeyoung Kim, Jiyoung Kim,
Minwook Lee, Jeehoon Hyun

The issues that have been raised in the development process of vocational education and training(VET) are the mismatch between the job competency and the contents of education and training in VET institutions. In order to solve these issues, the government suggested National Competency Standards(NCS) to build industry driven VET systems. Accordingly, various projects related to NCS have been undertaken since 2013. This study analyzes the countries (Australia, New Zealand, England, Canada) that have been adopted and implemented NCS for the past twenty years; how they handled the various issues; and draws implications for the sustainable NCS policies.

The purpose of this study is to identify how the policies of the aforementioned countries have evolved through political and historical analysis. Additionally, this study identifies the success factors of policy development to draw implications for the current issues.

The scope of this study covers political and historical development of NCS, the governance system of key players that are related to NCS, NCS learning modules, qualifications, VET curriculums, and training, and the issues that are raised in the process of NCS policy process and how it was resolved. The analysis framework was developed, and our research team visited Australia, New Zealand, England, and Canada to interview researchers and practitioners, and collected confidential documents.

This study suggests following implications.

- (1) Performance management of key players related to NCS
- (2) Identification of roles and responsibilities of institutions that are related to NCS

- (3) Enhancing the competency of VET trainers
- (4) Support for the realistic budgets for NCS related policies
- (5) Developing a policy evaluation models for NCS, learning modules, and other projects.

The Effects of Basic Income on the Labor Market in the Era of 4th Industrial Revolution

Jeong, Weon Ho, Lee, Sang Jun, Kang, Nam Hoon

The main objective of this study is to facilitate social interest and discussions regarding basic income and to enhance policy mindset on basic income. The study focuses on the investigation of the labor market effects of basic income, among other issues.

First, the labor market outlook in the fourth industrial revolution is briefly reviewed, which is the main background for enhanced interests in basic income. Employment is expected to show a sharp decline, while the labor force is polarized, and in order to overcome these obstacles, a new paradigm, such as basic income, is required, rather than traditional labor market policies and social security policies.

Second, the concepts and the necessity of basic income are reviewed in detail. Basic income refers to a universal cash benefit unconditionally granted to everyone on a regular basis. It has advantages over minimum income guarantee, which is a traditional social security policy, as it does not have any stigma effect since it is not conditioned on asset test or work requirements. Also, basic income could be more effective compared to negative income tax, as it does not provide disincentive to work.

As such, middle income class is among the beneficiaries of basic income, which makes themselves the supporters for basic income, which, in turn, increases the political feasibility of the policy.

The need for basic income is raised from different aspects. From the philosophical perspective, basic income is required to guarantee substantial freedom as a human and it is also justified from the perspective of joint distribution of common property. In addition, it could be an effect policy tool to sustain aggregate demand in the economy while the jobs are disappearing with increasing number of precarious workers, as discussed earlier. Furthermore,

environmental dividend and territorial dividend could be effective policy measures to address environmental problems, which pose serious threats to humanity and real estate speculation, which is a widespread social problem in Korea.

Specific models used for introducing basic income are reviewed, such as those that have been implemented or piloted in Alaska, Namibia, and India and three German models(Werner's model, solidary citizen's income, livelihood benefits) as well as the RSA basic income model. While there were no clear similarities observed among them, it was found that the models were determined by either the situation they are in, the goal they are trying to achieve by basic income or their political stance.

In the light of the above mentioned models, Korean basic income model is proposed. It takes the form of citizen's basic income, targeting at all the citizens, which is a partial basic income of KRW 300,000, comprised of citizen's dividend of KRW 200,000, environmental dividend of KRW 50,000 and territorial dividend of KRW 50,000, which would help address environmental problems and real estate issues. In order to secure the budget for citizen's dividend, citizen tax is levied, for which 10% tax rates will need to be applied to all the household income. In addition, for the environmental and territorial dividends, sources of environmental pollution and land owners are required to be levied KRW 30 trillion respectively.

Lastly, the labor market effects of basic income, which is one of the most controversial issues in introducing basic income, is examined. From the macroeconomic perspective, it redistributes income from the individuals with lower propensity to consume to those with higher propensity to consume, thereby increasing the consumption. A rise in consumption induced by basic income will increase the income through the multiplier effect, which, in turn, will increase the labor demand. Such multiplier effects were clearly found in the pilot cases of basic income conducted in India, Namibia, Seongnam-si of South Korea,

Work incentive effect, which is the most controversial issue, was not found to be negative. One of the advantages that basic income has over minimum income guarantee is that there is no risk of falling into the welfare trap, where the beneficiaries choose to live on welfare instead of being employed. Thus, as compared with selective income guarantee, basic income does not lower work incentives of the low-income households. The basic income experiments planned in Finland and the Netherlands in 2017 are aimed at providing empirical evidence for the hypothesis that basic income has lower risk of unemployment

trap by comparing its work incentive with the unemployment benefits.

Further more, basic income encourages start-up businesses. Financial risks are to be borne when starting a new business, and once basic income is granted, people can better bear financial risks. Also, once people are freed from concerns about livelihood, they could have more time for chasing dreams, which will enhance creativity required for a start-up.

At the micro level, the effects of basic income on wages are unclear. This is because high-wage earners and low-wage earners have different labor supply curves, and the labor market for low-wage earners are complex as they are divided into jobs that are unfulfilling and difficult and those that are not. However, at the macro level, basic income is likely to increase market wage, as it enhances labor demand through multiplier effect. Also, basic income will contribute to lowering the unemployment rate and strengthening bargaining power, thereby resulting in higher market wage.

Lastly, positive employment effect of basic income is relatively clear. Firstly, if a worker receives the basic income and becomes economically inactive, employment rate will decrease but unemployment rate will also decrease. Secondly, policies such as unemployment benefits raise unemployment rate due to its nature. People would not switch to be economically active in order to receive unemployed benefits as basic income is paid to economically inactive population as well. Thirdly, basic income will contribute to job sharing policy by reducing work hours which would lower unemployment rate.

The labor supply effects of basic income is unclear. Overall, the labor supply of high-wage workers will decrease while the labor supply of low-wage workers is expected to increase by expanded participation in economic activities. Among the low-wage workers, labor supply will decrease in the areas where work conditions are poor and jobs are not fulfilling.

In the light of the above, the author finally argues that the basic income needs to be introduced in Korea, suggesting the following policy implications:

First, more profound researches are required to tackle various perspectives of basic income.

Second, biased views against basic income should be removed in political scope.

Third, various kinds of basic income experiments are required.

Fourth, basis for expanding basic income needs to be established based on its accurate assessment.

Building the Ecosystem of Youth Start-ups in Korea

Kim, Ahnkook, Park, Dong, Lee, Jongseon

1. Overview

This study aims to explore the ecosystem of youth start-ups in Korea. We focus on the maker movement and maker start-ups to build up the start-ups ecosystem in Korea. To set up ecosystem of start-ups, the activities of maker movement and maker start-ups have to be encouraged by Korean society. Maker movement and maker start-ups will bring out good results to Korean economy which is now in trouble, especially low youth employment rate and overall industries' downing energy.

Currently the government helps directly maker start-ups, but the government's aid should have gone to the private business firms which give good services to maker start-ups. To encourage maker movement, the government should contain the making programme into regular education curriculum.

2. The start-ups and maker movement in Korea

We look into the real details of youth start-ups in Korea. Youth start-ups do not have good results in business category and existence rate. Youth with higher education prefer employment to making their own business, youth running start-ups feel fear of failures. But the amount of seed money for start-ups in Korea is much more larger than that of OECD countries.

Now the maker spaces created voluntarily are scarce, most maker spaces are made by government. The maker spaces run by government are usually not efficient, only just constructed for showing up.

The activities in the maker movement are low as DIY level, cooperation and using open sources are not common. The number of participants in maker fairs and maker festivals is increasing, and private business firms which give aid

services to maker start-ups are growing in quantity and quality. But in Korea, people's intent to make start-up is usually very poor, and in competitive culture, open sources are not easily provided to the makers.

3. The theory of start-up ecosystem and maker movement

The fourth industrial revolution is making the ecosystem of start-ups different from the old frame. IoT, 3D printing, and AI change the paradigm. And the economy where the information and knowledge are shared is advancing, so technology learning is easily got by individuals. The seed money for start-up is procured easily by crowd funding method, and many business firms which help the maker start-ups in various activities spring off.

To set up the theory of youth start-ups ecosystem, we borrow the Isenberg's idea. He found out the components of start-ups ecosystem, and focused the relations between the components. He also stated firmly the importance of software like participation, reliance and cooperation, learning, understanding, experience, mind-set, commitment. According to Isenberg's idea, we set the main components and theirs items, constructing the maker start-ups ecosystem. There are six main components, in detail government policy on the makers, maker culture, maker spaces, finance aid for makers, events like maker fairs, maker networking, markets for makers.

4. The survey and analysis on the maker movement

We made survey on the maker movement. The survey has the questions on the main components and items which are the parts of maker start-ups ecosystem. We asked questions to the makers who are the members of on-line or off-line maker communities. The results are like as expected.

First, the most frequent activity is just DIY, and the least frequent activity is starting maker start-up. Makers expect the maker fair will be popular as soon, but they expect maker start-up will not be spreaded so well. Makers think that maker movement will not be developed well in Korea.

Second, makers think the most important area is government policy and maker spaces at building up maker start-ups ecosystem. The weaknesses of maker movement in Korea come from the fallacy of government policy, scantiness of maker's culture, and meagerness of maker's ability.

5. The case study on the other countries' maker movement

We made case study on the maker movements, especially USA and China where maker start-ups grow faster and private business helping makers is increasing.

Tech-shop in USA is a space where entrepreneur, artists, students can make something and learn with special equipment like laser cutting machine, 3D printer, and CNC. The spaces also provide the open sources information and knowledge to make something and to network with the specialists. People can make things they conjecture in mind.

MIT Fablab which is run by federal government fund and supports of private firms is a laboratory for making. In the fablab, people can make prototype digital machinery after experimenting the ideas through open sources designs.

Shenzhen in China, there are so many business to help maker start-ups, which are usually aided by the government. The business helping maker start-ups grows rapidly and many smart and highly educated young people come to Shenzhen to get the opportunities.

Maker spaces help the maker start-ups in realizing the ideas into concrete design, and provide the services making prototype from the design through the network chain of manufacturing firms. Next, maker start-ups will meet accelerators which will invest them and help them to succeed in the markets.

Shenzhen government encourages to create maker start-ups, and help the maker start-ups with the universities and research institutes to give technical aids. And the government gives out services incubating start-ups by incubator center and angel funds.

6. The policy suggestions to booster maker movement

1. Korea government should prepare the making programme into regular education curriculum especially in primary schools. The programme should include also learning on AI, IoT, big data, VR, Arduino etc.
2. Maker spaces should be improved to match the needs of makers. The maker spaces run by government should be places for simple making course and education about 3D printer and circuit for micro controller. The maker spaces well equipped with special machines should be the place for maker experts and should be managed by private business firms.

3. The maker communities which are run by the government should be abolished and the government aid for that should go to the maker communities which were created voluntarily and are functioning well. The government should also try to find out the way to aid maker's off-line activities.
4. Now the aid of government for the maker space and maker start-ups crowds out private business activities helping maker movement or maker start-ups. Like as USA and China, Korean government should support the private business firms which give services to maker start-ups.
5. The maker's ability should be developed well through the education programme for makers. The programmes for makers should include the contents to raise the abilities, solving problem, creativity, innovation spirit, experimental attitude etc. For the educating makers, polytechnic colleges can be used by networking specialist pool.
6. Korean government should encourage the maker culture and help the maker's activities. The exhibitions run by the government like 'Makerston' should be stopped because it is almost same as start-up contests. Korean society should have the social value in making, the government should make a lot of efforts to make it.

Current state and issues of career education under the Career Education Act 2015.

Yoojeong Nadine Seo, Suwon Kim
Cheonsoo Park, Yoonkyoung Jeong

Since the implementation of Career Education Act at the end of 2015, national interest on career education has been even more greatly increasing. More than 3,200 middle schools adapted Free-Semester programme for the students to explore their potential career paths and informations.

However, many of the schools still lack the manpower or the facilities to conduct effective career education. In addition to that, the role and function of National Career Education Centre should be established and the direction for the future policy for career education should be considered. This study examined the state of career education from primary to higher education levels, conducted FGI to receive field opinions, and explored the ways and recommendations to improve current situation.

Four strategies were recommended for future career education policy, each with a number of sub-strategies: 1)reinforcement of career education at primary and secondary education levels, 2)expansion of career education at higher education level, 3)reinforcement of infrastructure supporting career education, and 4)revision of Career Education Act.

The sub-strategies of ‘reinforcement of career education at primary and secondary education levels’ were as follow.

- Organisation and operation of school career education curriculum
- Reinforcement of Career Development Competency and Career Values education from Primary education level
- Guidance and criteria for the arrangement and operation of career teachers and assistants
- Quality control for the training courses of career teachers

- Establishment of effective career counselling system in- and outside of schools

The second strategy, 'expansion of career education at higher education level', produced the following sub-strategies.

- Career guidance tailored for majors
- Operation of careers advisors that can manage career guidance and programmes and enhancing their competency
- Development of career education material tailored for type of education institutions and majors
- Higher education Career Index Survey
- Establishment of management system for the linkage between higher education and field of work

The third, 'reinforcement of infrastructure supporting career education' named four sub-strategies as below.

- Establishment of the role and function and of cooperation system for the National Career Education Centre as the hub and leading institution for national career education
- Enhancement of role and functions of the Regional Career Education Supporting Centre
- Reinforcement of career guidance system tailored for the vulnerable groups
- Reproduction of career information and contents to improve utilization and Enhancement of ICT of teachers and students

Finally, 'revision of Career Education Act' produced the following 3 sub-strategies.

- Proposal of 'Career Education Fundamental Act' to include school education and life-long learning
- Expansion of Work Experience host institutions and setting up the guidelines to reimburse the cost of work experience provision
- Refinement of clause in relation to vulnerable groups' career education

A study on Career Experience Activities in the 'Free Semester(jayuhakije)'

Kim Seung-bo, Chu Hui-Jung, Kim Young-Sik

The purpose of this study is to suggest policy implications for Career Experience Activities in 'Free Semester(jayuhakije)' in Korea, given the fact that Korea has fully implemented 'free semester (jayuhakije)' since 2016.

To examine Career Experience Activities in 'Free Semester(jayuhakije)', this study surveys major participants perception for Career Experience Activities field in Korea and interview with overseas experts.

This study reviewed results of major participants perception research of Career Experience Activities in the 'Free Semester(jayuhakije)'. The majority of respondents agree that Career Experience Activities in the 'Free Semester (jayuhakije)' have been in progress satisfactorily.

Given data collected from interviews with overseas experts in London, England and Tokyo, Japan, Each local government has emphasized the importance of Career Experience Activities and has made great exertions the quality improvement of Career Experience Activities.

This study suggests the following policy implications for Career Experience Activities in 'Free Semester(jayuhakije)' in Korea: 1. Building the infrastructure for community-based system(Modeling the organizational community-based ecosystem for Career Experience Activities), 2. Total quality management of programs and contents for Career Experience Activities, 3. Program Operation and Collaborative Governance for Career Experience Activities, 4. Efforts at spread and impact for promoting Career Experience Activities.

A study on link the loan and grant in BEAR project

Cheol Hee Kim, Tae Jun Park, Hye Jun Yoon

1. Purpose of Study

Korea-UNESCO BEAR Project(Better Education for Africa's Rise) is an official development assistance(ODA) project for TVET (Technical Vocational Education and Training), funded by the Ministry of Education of Korea, of which the first project is currently on the phase of completion. This study investigates various ODA(or international development cooperation) projects as well as the BEAR project itself, focusing on the practice of linking multiple ODA projects. In regards to the completion of the first BEAR project and the preparation of the second BEAR project, this study aims 1) to suggest the ways to link multiple ODA projects in order to enhance the impact and sustainability of the first BEAR project and 2) to develop a model for ODA project for more effective collaboration of multiple projects in order to seek ways to enhance the stability of the second BEAR project.

2. ODA and Linkage

In this study, ODA linkage is operationally defined as collaboration or collaborative relationship of multiple ODA projects or ODA agencies. Examining the theoretical background of ODA linkage, the framework of ODA linkage has two dimensions; 1) linkage of ODA policies and 2) linkage of ODA implementation. The former, linkage of ODA policies, is a macro-dimensional linkage by developing coherent ODA policies and operating an integrative ODA system and agency. The latter, linkage of ODA implementation, is mainly divided into different linkage types by the following three aspects; whether international or intranational linkage, roles of loans and grants, and portion of grants. Currently, Korea is actively developing and supporting package-type aids

for its ODA projects in diversified fields. Also, the Korean Government has formed the 'Committee for International Development Cooperation' in 2010, which plays a role as the control tower in developing strategies for government-wide integrative ODA policies, examining progress of ODA projects, running a consultative group for relevant agencies and departments, evaluating ODA projects and etc.

This study uses three theoretical frameworks to analyze and classify the types of ODA linkage in international cooperation; sequential and structural(synchronic) linkages, homogeneous and heterogeneous linkages, and intra-national and international linkages.

3. Linkage with BEAR Project

The UNESCO BEAR(Better Education for Africa's Rise) project, an ODA project financed by the UNESCO and the Ministry of Education of Korea Funds-in-Trust co-operation, supports capacity building for TVET in five African countries; Botswana, DR Congo, Malawi, Namibia, and Zambia. The Ministry of Education donated to the UNESCO Trust Fund 10 million USD for the BEAR project over five years since 2011. In June 2016, the Ministry confirmed to donate additional 10 million USD for the second BEAR project over the next five years until 2020, as a part of the four big initiatives for international development cooperation by President Park's regime.

The UNESCO headquarter designed the first BEAR project with three complementary TVET programs(Result 1, 2, and 3); 'Result 1' is to develop curriculum based on the labor market analysis, 'Result 2' is to provide teacher training, and 'Result 3' is to build the Management Information System(MIS) of education. Due to some complicated issues and regional conditions, UNESCO has planned to embark on 'Result 2' and 'Result 3' after completing 'Result 1'. The KRIVET joined 'Result 1' as an implementing agency for developing the TVET curriculum based on the labor market analysis. Even after completing the project, the KRIVET still has been supporting the sustainability of the curriculum and educational foundation system by providing TVET textbooks, training TVET experts, and consulting TVET schools.

BEAR is a software-centered ODA project, which aims to enhance the capacity of TVET institutions and experts in the recipient countries. In other words, BEAR sets its goals in micro-perspective levels to improve the different levels of capacity of individual participants in each phase of the project. This kind of setting is unusual in many other ODA projects, which often regard the regional capacity just as the final outcomes. This trait of the project is a differentiated and advantaged aspect of the BEAR project, which contributes to the positive feedback in the evaluation. Indeed, all reports that were submitted as the outcomes of the project were written by the local participants of the recipient countries in order to develop their capacity for conducting TVET projects. The TVET experts from Korea provided feedback on the reports to improve the local participants' practical capacity for TVET projects.

The second BEAR project should find actions to solve problems and limitations of the first BEAR project based on the result analysis, in order for the BEAR project to overcome the limitations of ODA projects and sustainability issues, and to further develop and spread out the accomplishment of the TVET curriculum development by the BEAR project. Through this, the BEAR project could suggest ways to stabilize the foundation for sustainable development and growth in African countries. Particularly, it is necessary to create a multidimensional development cooperation model by seeking possibilities of linkage among projects beforehand. This can help the success of V-CODE project implemented to enhance the sustainability of the first BEAR project as well as the efficiency of the second BEAR project.

4. Analysis of Linkage in International Development Cooperation

In terms of the current ODA system in Korea, its implementing body is divided by the aid flow types, loans or grant. Grant aid is executed by KOICA(Korea International Cooperation Agency) and about 40 other government agencies. However, loan aid is executed as part of the EDCF(Economic Development Cooperation Fund), which is managed by the Export-Import Bank of Korea, to support international development cooperation between Korea and developing nations. The Export-Import Bank of Korea is an ECA(Export Credit Agency), which is established to promote domestic companies to expand their business abroad. However, many countries but Korea, which are providing loan

aids, often do not differentiate the types of aids by whether loan or grant aid. Rather, these countries differentiate the types by the technical cooperation sectors, such as financial cooperations or consultations, which emphasize the monetary flows of both loan and grant aids.

Regionally, other ODA grant countries mostly provide grant aids to the poorest countries that are difficulty redeem the grants, but support infrastructure projects mainly through financial cooperations, or loan aids. In other words, other grant countries are not likely to divide aids into grant and loan by the flow type, but into finance and technique by the functions, which enables the dual implementation of grant and loan aids within a single project if necessary. In Korea, however, grant and loan aids are divided not by the functions but by the flow types, which even divide the implementing agencies. Therefore, ODA can be only implemented as separate projects by the flow type, whether grant or loan, even if both types of aids are needed within one project. Even though some linkage projects of loan and grant aids have been implemented already, the reason for the limited amounts of these linkage aids is that linkage projects are only considered as a combination of different flow types, but not as a collaboration of different functions(financial and technical cooperations). Hence, it is needed to change the division paradigm of ODA projects from flow types to functional types, financial and technical cooperations, in order to enhance the linkage of loan and grant aids for future ODA projects of Korea.

5. Linkage for BEAR Project

A plan for linkage of loan and grant aids for the BEAR project should be implemented, focusing on capacity building for implementing ODA projects for TVET, and ultimately enhancing efficiency and sustainability of the BEAR project. To do this, a plan for the BEAR project in the current stage should put a focus on improvement of the results of the first BEAR project as well as preparation for implementation of the second BEAR project. Hence, the follow-up project should set a goal to sustain, enhance, and disseminate the accomplishment of the BEAR project with a vision to develop competence for TVET in African region.

This study concludes with suggestions for strategies to realize the vision; first, through sequential and structural(synchronic) linkages, the project implementation

system should be constructed to take advantage of synergy from the combination of related projects and the coherence of core projects. Second, through the fusion and convergence of homogeneous and heterogeneous linkages, the effectiveness and influence of the BEAR project should be maximized. Especially, since education and TVET are closely related to public policy sectors including employment labor, social welfare, and industry, it is necessary to promote linkage with other development cooperation projects in various fields. Third, it is important to promote linkage between intranational and international projects. The current BEAR project is not actively collaborating with international or international ODA projects. Thus, forming and running a network is necessary to cooperate with various international development cooperation agencies/agents working in not only the intranational community but international.

The Actual Condition Investigation Analysis and Development Plans on Specialized Vocational High Schools Project Supported by Government Ministries

Ki-Hong Kim, Il-Gyu Kang

1. Research Overview

The number of schools and students that participate in specialized vocational high schools project supported by government ministries is 101 and 66,379 in 3 ministries, 2 agencies of 2011, 230 and 152,752 in 3 ministries, 2 agencies of 2015 respectively, which grew quantitatively, however, through fostering manpower required in the departmental growth engines industry, structural manpower shortage industry, most of the projects are a mere budget support unlike the purpose to invigorate employment of high school graduates and reduce the manpower mismatch. Participating ministries should be involved in organizing and managing curriculums and developing teaching and learning materials to foster manpower with specialized skills and capabilities by industrial sector that meets specialized vocational high schools project and be a active role so that participating students may have job opportunities for industrial sectors of related ministry, when graduating. Also, there are difficulties in information exchange between participating ministries, schools, and in ministry-school information exchange and there is a lack of the sharing of the best practice cases and the benchmarking opportunity by ministry and school to support and push forward with effective manpower training project. Therefore, there is the difficulty of ministry-school developmental sharing on the project implementation status, budget management, and major outcomes and results. it is also difficult to ascertain whether a budget overlap is or not due to the information shortage problem on support status.

The purpose of the research is to suggest the policy improvement plans by

investigating the operation condition(current status and problems) of specialized vocational high schools project supported by government miniseries so that specialized vocational high schools project may be strengthened employment of high school graduates and may be field-centered education and training that education consumers are satisfied. The research applied its methods of literature review, actual condition investigation, and expert conferences to produce objective and appropriate result.

2. Research Result

The analysis on actual condition investigation of specialized vocational high schools project supported by government miniseries shows that current status (sufficiency of specialized curriculum or programs development, adequacy of teaching and learning methods and evaluation methods, regular-based practicum) of the system construction to participate in the project and the satisfaction (a operation system, networking between departments, connected curriculum operation between departments, outcome management and evaluation) with the project operation are high. It also shows that exclusive teachers of specialized subject for the project and employment support for participating students are overburdened. Difficulties and improvements in managing of specialized vocational high schools project supported by government miniseries are as follows. The factors in difficulties include ‘the lack of professional manpower for program operation’, ‘the insufficiency of network construction with related departments, commissioned operating institutions, and industries’, ‘the insufficiency of practicum and the field trip substantiality’. Improvements in managing include ‘strengthening of a cooperating supporting system of budget support departments and the Education Ministry, and provincial offices of education’, ‘extending of budget items and flexibility securement’, ‘excavating support of contracting industries and extending of participating industries support’, ‘improving labor condition and extending of training support for teachers in charge’, ‘strengthening of public relations of a supporting project’, ‘developing of programs and excavating of best program cases’, ‘improving of school character-considered evaluation’, ‘strengthening of participating students support’, which are required. Therefore, the research supposes the long-term development plans and policy proposals for specialized vocational high schools project supported by government miniseries as follows.

First, specialized vocational high schools project supported by government ministries should be extended. To accomplish this it needs to train manpower that a department in demand requires and support the operation to connect to employment by introducing ‘school joint operation’ or ‘committed operation across the board’, not supporting simple program operation. Also, it needs to construct a support base of a supporter to train manpower with a high school diploma by city and province and extend participating schools annually through excavating the new field and tasks related to a project supported by government ministries.

Second, it needs to invigorate operation of specialized vocational high schools project supported by government ministries. To accomplish this it needs to strengthen ‘manpower training-employment connection of a high school graduates’, ‘minimizing of career discontinuity due to military service of specialized vocational high school graduates’, ‘relieving of restrict qualification of specialized vocational high school students’, ‘creating and managing of intellectual property in invention specialized vocational high school and related departments, and establishing certified technician qualification of national technical qualification items in the new field like a patent agent’, ‘developing of specialized programs connected to the NCS-based curriculum’, ‘managing and monitoring of project outcomes’.

Third, it needs to improve specialized vocational high schools project supported by government ministries. To accomplish this it needs ‘strengthening of a network system for specialized vocational high schools project supported by government ministries’, ‘establishing of a consulting support system for specialized vocational high schools project supported by government ministries’, ‘improving of a support system for specialized vocational high schools to participate actively’, ‘making effective project promotion plans in participating schools’.

A study into the current state of workplace bullying in South Korea and for the preventive and reactive actions

Yoo-Jeong Nadine Seo

Ji-Eun Lee

This study aimed to analyse the current state, potential causes and consequences of workplace bullying and offer recommendations to prevent and react to the issue. The report began by contemplating the definition of workplace bullying and reviewed the previous literature (Chapter 2). Then, out of the 21 industrial sectors classified by the Korean standard Industrial classification, 15 sectors were selected, which collectively cover 98% of the working population in South Korea. Using quota sampling, 200 employees from each sector were surveyed, in total, 3,000 cases were collected. In addition, qualitative study was conducted data collected from FGI of 17 employees, 11 native experts on workplace bullying, and 3 overseas experts (UK, New Zealand, and Japan) (Chapter 3). Legislation and policy of Korea and foreign countries were studied and the related regulation of Korean organisations and preventive education contents were examined (Chapter 4). Recommendations were made at three levels: National, organisational and individual levels.

At national level, 1) detailed and clarified consolidations of laws and regulations, 2) operation of exclusive organisation to handle workplace bullying that reports to the relevant Ministries, and 3) preventive educational contents development and training of educating personnel were recommended.

At organisational level, 1) a strong message from business owners/ CEOs that bullying would not be tolerated, 2) consolidation of internal regulation, 3) operation of exclusive division/personnel to handle relevant issues, 4) close collaboration with the trade union, and 5) increasing awareness amongst workers and managers were recommended.

At individual level, 1) increasing self-awareness of workplace bullying and coping competency by actively participating in the relevant education, 2)

appropriate handling of the issue as a victim/witness/ manager, and 3) reflection of one's own behaviours and participation in creating positive organisational culture were recommended.

Further studies were also recommended over 1) the cost analysis of workplace bullying, 2) analysis of cases in which the perpetrators were subordinates in comparison to bullying by superior/peers, 3) detailed analysis of court cases, 4) further analysis of the influence of organisational culture on the manifestation of workplace bullying, and 5) overcoming the limitations of KICQ.

Diffusion of AI(Artificial Intelligence) and Change of Skills

Gyuhee Hwang, Sangho Lee, Hyewon Jang

While AI(Artificial Intelligence) is substituting the abilities of cognition, learning, and reasoning which previously were regarded as being possible only in human being, there are growing cautiousness in society on how to respond to this challenge in policy level. In this circumstances, this study attempts to analyze how the changes of skills are being processed with a regard to the diffusion of AI and aims to provide a set of policy choice with the degree of importance and urgency in the response plan.

It is expected that the repetitive tasks(routine tasks) of professional jobs as well as the functional skills will continuously be substituted by the diffusion of AI. When we consider the recent trends of skill's change related with the technological changes like AI, it is recommended emphasizing cognitive abilities in the vocational education and training, that enable more preemptive response. Furthermore, it is considered to strengthen the communication skills to enhance group reponses and collaboration rather than individual responses.

The survey of experts regarding the human resource policy responding to the development and diffusion of AI in 10 years, shows that the importance and urgency of training for highly potential manpower is very high comparing with the facilitation of development in cognitive abilities, social skills in education and training, and enhancement of basic programming education in secondary education.

Meanwhile, the diffusion of AI will consistently create new business opportunities while perishing the current jobs. Furthermore, as there is an advancement of new technologies, services like maker's space or online and offline maker's community activities stimulate start-up activities based on sharing ideas and technologies and also crowd funding to support the prototyping and production funding is significantly reducing the initial costs for start-ups. Accordingly, the initial costs for start-up companies are being reduced

to five percents comparing to the past and it facilitates set up a company.

The survey regarding the importance and urgency of concrete vocational education policy responding to the diffusion of AI explains that the start-up education to activate AI based start-ups is more important than the on the job training for re-skilling and the enforcement of cognitive abilities and social skills in lower trained occupations. Therefore, as the maker's start-up is being considered more important, it is suggested that the education course or start-up course for makers need to be included in the curriculum.

A Study on Improvement of Laws Related to Teachers for Application of NCS-based High School Vocational Curriculum

In–Yeop Kim, Jong–Ho Jeon, Se–Jeong Yi

This study was conducted, upon request of Ministry of Education, in order to define the qualities required for teachers of specialized subjects that are distinguished from general teachers according to high school vocational curriculum based on national competency standards (NCS), and also propose specific improvement of the legal system related to appointment, fostering, training, and supporting teachers of specialized subjects. Also, by building a road map for mid-to-long term improvement of the relevant laws and systems, the study aimed to help establish the new curriculum in schools in an effective manner.

For this study, expert meeting and literature review were performed. Considering that NCS and NCS curricula are created and operated based on cooperation between the education field and industries, a Focus Group Interview (FGI) was conducted among education-related professionals such as working teachers, school administrators including principals as well as education officers related to vocational education (senior supervisor, junior supervisor etc), and industrial professionals with good understanding of NCS and vocational high schools(including company executives, association officials, and industrial experts), who had discussed and exchanged opinions related to the current problems and possible improvements.

Opinions of the expert advisory committee consisting of government officials from Ministry of Education and Ministry of Government Legislation, which is directly involved in the administration, were actively taken into account.

Based on opinions collected from the FGI, Focus Group Discussion (FGD) was conducted among professors of teachers training institute, officials of

relevant government departments, officials of local offices of education, educational professionals related to vocational education, and law experts who are involved in fostering, appointment, training, and supporting teachers of specialized subjects, in order to identify fundamental issues yet examining suitability, executive and legislative feasibility of the proposed improvements.

Finally, considering the likely effects of this study on the field, beneficial to secure reliability and validity, the Delphi method was also applied for making a reliable prediction and bringing out consensus based on anonymity and controlled feedback process. The expert panel for the Delphi survey was created by sending official notices to the relevant institutions, follow by gathering an equal number of experts from both the field of education and industries based on researchers meeting and experts advisory committee.

Definition of qualities of subjects based specialized teachers, short-term improvement and mid-to-long-term review of fostering, appointment, training, and support of teachers for application of NCS-based vocational high school curriculum, with referred to the mentioned above process as well as relevant legal systems are as follows:

First, teachers of specialized subjects, like general teachers, must possess skills related to teamwork and communication, student instruction and class management, yet have a sense of duty and willing to sacrifice. Such humanity qualities shall prevail above all other qualities. Also, in addition to expertise and practical skills related to the field, they must possess a passion for and faith in vocational education, instructional design skills, and ability to plan curricula.

Second, regarding fostering of teachers, six items were identified as pre-requisite for improvement. For short-term improvement: ① NCS curriculum must be introduced to teachers training institutes, ② industrial field practice must be introduced, and ③ practical subjects in the basic curriculum must be changed. On the other hand, for mid-to-long term improvement, ① practical education consignment system, and ② teacher certification system must be introduced. Meanwhile, if industrial field practice is introduced, eight weeks is thought to be an appropriate period, and practical subjects will need to account for 30% to 50% of the basic curriculum but may differ considering characteristics of the subjects and teacher training institute.

Third, regarding the appointment of teachers, eight items were identified as requiring improvement and, among them excluding the dual system of employment examination, the need to executing them is great. Items that need to be introduced most urgently, in short term, include: ① the requirement of practical qualification in the teacher appointment process, and ② the inclusion of a practical test in the teacher appointment exam. Moreover, items that must be reviewed for mid-to-long term adoption are ① an expansion of the industry-academy teacher system, and ② flexible appointment. Especially, for the latter, overall method for special appointment of experienced industrial professionals and flexible employment of temporary teachers were proposed. Specifically, it was proposed that appointment of industrial professionals be limited to specialized areas for which official subjects are not assigned, such as semiconductor and energy, and flexible appointment of temporary teachers are based on the open employment system for civil servants. In other words, the proposed method was that people who have experience in the relevant industry and official teacher qualification can be employed by the office of education or education support agency and assigned to schools;howsoever limited special appointment is allowed to those who complete a certain period of teaching and show outstanding professional performance through special examination. A flexible appointment can allow people who have a good understanding of the industry and teaching to be included in the field of education. As a result, further, detailed review based on policy research is required as a flexible appointment would results in a significant conflict of interest between teaching position applicants, and therefore, requires a highly precise plan.

Fourth, regarding training and support of teachers, 11 items were identified as requiring improvement. Items that need to be adopted in short term include: ① mandatory training for NCS-based industry job, ② securing and providing funding for teacher training, ③ establishing areas of job training and raising the required credits, ④ long-term industrial training, ⑤ linking job training performance and teacher evaluation, and ⑥ reducing the number of students per class. Meanwhile, items that must be reviewed for mid-to-long term adoption are ① an expansion of the research year system and ② linking local companies with central and local offices of education.

All items related to training and supports of teachers were found to be highly necessary. This finding suggests the participants in this study agreed that, in order for the NCS curriculum to be settled, systematic training and support for currently working teachers are required.

Fifth, laws that must be revised regarding fostering, appointment, training, and support of teachers of specialized subjects include: 「Elementary and Secondary Education Act」, 「Act on Promotion of Industrial Education and Promotion of Industry-Academy Cooperation」, 「Rules for Competition for Appointment of Candidates of Educational Civil Servants」, 「Appointment Ordinance of Educational Civil Servants」, 「Enforcement Ordinance of Elementary and Secondary Education Act」, 「Rules for Training of Teachers and Others」, 「Enforcement Ordinance for Training of Teachers and Others」, and 「Standard Curriculum for Qualification Training of School Principal (Director), Vice-Principal (Deputy Director), Master Teacher, and Regular Teachers」, and drafts for amendment of the relevant laws were proposed in this study based on an advisory meeting of law experts.

A Study on Local Government's Support for the Locally Tailored Jobs Creation Support Initiative and Lifelong Vocational Education and Training

Il-Gyu Kang, Ki-Hong Kim, Sang-Beom Woo

Learning for work brings the stability of employment to this modern society. The government provides wide range of policies to make it work successfully. In particular, the central government has amended and improved the existing policies to the changing social situations with the policy initiatives.

In these circumstances, the role of local government becomes important more and more as the local autonomy(self-governing) has been fully implemented.

The regional and basic local governments cooperate with the central government and the other local governments to develop their region and improve their peoples' quality of life with the various policies according to local characteristics.

This study aims that the local government should lead the central government's Locally Tailored Jobs Creation Support Initiative and link the Initiative with the local's lifelong vocational education and training to boost the both policies based on the roles and functions of the central and local governments. In other words, the local government needs to more vigorously support creating jobs and lifelong vocational education and training for their people.

On the basis of the theoretical background, this paper investigates the current status and products of the Initiatives, and also finds the excellent cases from it. With those investigation and finding, the paper presents their implications for making plans to improve the Initiative.

The study suggests that the central government needs to empower the local governments and decentralize its employment policy, and that the local governments need to create jobs more effectively by linking the industries related to the regional characteristics with the support programs for the local people's lifelong vocational education and training.

Thus, the local governments should match the local lifelong vocational education and training to the industries covering their regional characteristics with the assistances from the central government. To accomplish this matching process successfully, the local governments must operate efficiently the governance system with the related organizations and build networks with them effectively. They also need to play the leading role in coordinating the system and networks as well as managing them.

With the basic policy directions underlying this idea, the current Locally Tailored Jobs Creation Support Initiative promoted by the central government needs to be conducted by local governments, which should drive the Initiative by linking it with their lifelong vocational education and training. Most of all, it is important for local governments to support strongly the whole process of policy formation, implementation and evaluation, and to work hard to stimulate the policy in an effort to its successful settlement and development.

In the process, a local government needs to take different lifelong vocational education and training programs to meet the regional characteristics. The differentiated programs prove to bring better results.

First of all, an employee-tailored lifelong vocational education and training is appropriate for ‘employment in the industrial region’ because the industrial complex works dynamically. One of the good examples is the Labor-Management Joint Training Program run from 2006. This has helped labor and management get together to develop and operate a training program for the employees. While some employees leave their workplace temporarily or use off-seasons to join the training program in order to improve their skills. In the construction industry, the workers get the vocational training during the off-season in winter. Apprenticeship (learning for work) system will work as a vocational education and training. The program of Practicing at workplaces while learning principles at schools such as Meister school is also a good example of industry-customized vocational education and training.

On the other hand, it is appropriate for ‘employment in the welfare region’ to take an lifelong vocational education and training focusing on the courses for the disadvantaged individuals or groups such as youths, seniors, old adults, career interrupted women, multi-cultural families, disabled people and North Korean defectors. The courses deliver basic training or qualifications programs for them to get a job. Given that most of current local employment programs are targeting at those people, a large number of the local employment program

are likely to be lifelong vocational education and training operated by local employment-welfare organizations.

This study concludes that the lifelong vocational education and training in the industrial region should aim at skills development for the employees in the region, while the education and training for work-to-welfare should focus on the unemployed to help them find jobs. If the unemployed succeed to get a job but they are still required to get on-going skill training, they are to be provided the education and training focused on the upgrading training. Overall, lifelong vocational education and training will achieve its goal when it covers the courses and programs for the employed and the unemployed as well.

A Study on the vocational training reform plan corresponding to the demand of the SW industry

Lee Sang Jun, Hong Kwang Pyo, Pyo Han Hyeong

The ICT industry has been a major industry in Korea's economic growth since the mid - 1990s. This is one of the most important policies to supply the workforce who lead the industry.

We need a new growth engine that correspond to the Fourth Industrial Revolution and it is time that promote a convergence of industry-leading.

The purpose of this study is to carry out the basic research which prepares a plan of the reform of vocational training policy for the training of the SW advanced manpower. As the new growth engine of the future, the changes and policy situation of the SW industry is considered.

We drew the following conclusions from the study. First, we identified the need for fostering advanced SW workforce through vocational training. Second, vocational training policies for advanced SW workforce need a number of changes in training expenses and time to train and so on.

Here are some of the strategies to reflect our findings. First, we need a manpower training policy through strengthening cooperation between the central government and the local governments. Second, institutional improvement is required to improve the management of vocational training programs centered on problem-solving skills. Third, we need to devise policies to expand corporate participation and participate in the training of employees.

A Study on Establishment Plan of National Industrial Education Center

Research in Charge: Ji Sun Chung
Researchers: Dong Park, Ho Jhin Kim

Overview

This study is carried on to achieve two goals. One is to define the role and functions that Industrial Education Center is expected to perform. The other goal is to suggest plans to establish and manage the Industrial Education Center to carry forward future demand pursuing industrial education at the national level. Analyzing the needs of promising industries, partnership of industry, academia, research institutes, and government would be emphasized in the context.

Methodologies

Some research methodologies are employed to fulfill the objectives of research. First, related domestic and foreign literatures and research works are reviewed to define the concepts and construct research frame. In addition, to analyze the current situations and problems to be solved, Focus Group Interviews have been implemented two times to discuss the experience and opinions of industrial education of experts. The experts group has composed of group of ten; university and college professors who have managed government policy projects, industrial personnel who have been involved in industrial education project to nurture human resources to fit the promising industries; and researchers who have been specialists in industrial development and human resources development.

A Legal Basis of Industrial Education Center

In this study industrial education implies education and training needed to develop competencies and ability for industrial jobs. Then industrial education embraces related terms in the wholistic viewpoint, such as vocational education, technical education, career education, employment education, star-up education, and lifelong education. In 2016, an article to establish an Industrial Education Center has been supplemented to ‘Improvement of Industrial Education and Acceleration of Cooperation of industry, Academia, and Research Institutes’ Act.

Industrial Education fit Industrial Environment

The fourth industrial revolution is changing the situation of labor market and modality of talents to lead the industrial development. Artificial intelligent, big data, IoT, 3D printer are replacing human jobs, which results in massive layoff. The fourth industrial revolution requires brainware who have not only creativity, specialty, and critical thinking, but also ability to realize their own ideas and specialties. To them what kind of work they are doing is more meaningful than what kind of workplace they belong to. Then the educational programs and methods should be all but innovated.

Role of Industrial Education Center

National Industrial Education Centre to be established to take function of think tank of comprehensive industrial education. Functioning of generalization and adjustment of industrial education policies and programs, the Center would improve the industrial education at a national level. Gran plan for the industrial education should be established in the long term, which is based on the analysis of future directions of development of industries and labor market changes. Future-oriented industrial education plan can be established.

Moreover entrepreneurship education would be main concern of the Center in the perspective of youth unemployment is a big social issue. Development of entrepreneurship education policies and programs should be main function. As the partnership of industries, academia, and government is the start point of industrial education In nature, the center should support the cooperation suggesting effectively. As the industrial education is main concern to ministries,

Ministry of Education, Ministry of Employment and Labor, Ministry of Science, ICT and Future Planning, Small and Medium Business Administration, etc., the cooperation among the related ministries would ease the performance. Industrial Education Center should take a role to facilitate the communication among them.

Establishment and Management Plan

Specialty of Korea Research Institute for Vocational Education and Training should be utilized to take a function as Industrial Education Center, which was established to perform tasks related to skills development thereby contributing to vitalization of vocational education and training and enhancement of the public's vocational competencies. KRIVET has undertaken policy research of vocational education and training at a national level.

To manage the Industrial Education Center efficiently, securing operation budget is prerequisite stably. When the Center push ahead with industrial education policies and programs of grand plan in the long term, the industrial education can be realized consistently even though the government is changed.

Organization and recruiting manpower are pivot of running the Center. Initially it is suggested that the organization can be composed mainly of five working teams with one director to carry out the tasks. Those are Team for Planning and Coordination, Team for Policy Research, Team for Implementing Policy Projects, Team for Entrepreneurship Education Policies, and Team for General Administrative Support.

International Comparative Study on Work-based VETs

- A case study on the automobile industry in South Korea and Germany -

Dong-Im Lee, Kirak Ryu
Ji Un Jung, Hikui Noh

The Work-based VET is recognized as most effective in terms of lowering the unemployment rate and raising the employment rate of the youth by decreasing skill mismatch. Among those countries implementing the work-based VET system, Germany is cited as one of the best cases.

During the period of 2015-2016, the BIBB of Germany, along with some European countries, identified patterns and types of the work-based VET and pushed for a project on the conditions for expanding corporate training. In particular, this project is based on the hypothesis that the two elements of training, ‘organization’ and ‘quality’ have certain relevance. Korea also participated in the project in 2016 by carrying out international comparative studies with the aim to create an atmosphere where corporate field training can be further expanded.

The purpose of this study is to compare the patterns and types of work-based VETs in Korea and Germany performing a microscopic case study on automobile makers and service(repair and maintenance) providers. It also aims to find out the conditions for expansion of work-based VET by asking why and how a company invests in education and investment.

In order to achieve these goals, following studies have been conducted.

In the 1st chapter, the methods and objects of the study are discussed, a variety of relevant questions are posed, and hypotheses required for the study are presented.

In the 2nd chapter, the notion and types of work-based VET and the scope of study are suggested. In addition, an extensive literature review was made in relation to work-based VET and in particular, various theories required for international comparative studies on work-based VET in the automobile industry

are examined. The major question concerning the Human Capital Theory, ‘why companies provide field training?’, has been repetitively dealt with in many studies so far. These discussions originates from the Human Capital Theory of Gary Stanley Becker, according to which the type of skill acquired from apprenticeship decides whether the company provides training and burdens the cost. Additional discussions were made about the theories concerning cost-benefits analysis on the VET and the correlations among production, work organization, and VET in the automobile industry.

In the 3rd chapter, a comparative analysis was made on the automobile industry, the labor market and the current status of VET and a review was made on recent cost-benefits analyses of the field training in Germany.

In the 4th chapter, a case study was conducted toward automobile makers and service providers in Korea and Germany and the results were compared and reviewed. Major areas of review are employment practice, employment cost, current training practice, cost-benefits analysis of training, work organization and long-term potential effects and limitations of work-based VETs.

In the 5th chapter, conclusions(implications) of the study and policy proposals are suggested.

Measures to Improve Teaching-Learning and Assessment Methods for the NCS-based Educational Curriculum

Minwook Lee, Daeyoung Kim

This study aimed to draw appropriate teaching-learning and assessment methods for the National Competency Standards (NCS) based curriculum as well as suitable policy support measures, through the analysis of the high school level NCS-based curriculum. In order to do so, the teaching-learning and assessment methods of the NCS-based curriculum — which is to be applied to all specialized high schools from 2018 — were analyzed, and the requirements and priority of each NCS-based curriculum teaching-learning and assessment methods were drawn. Based upon these findings, policy suggestions were made regarding some issues: 1) To operate a training program for NCS teaching-learning and assessment capacity building, 2) to disseminate the NCS teaching-learning and assessment methods management manual and well-practiced exemplary cases, 3) to reinforce on-job NCS teaching-learning and assessment methods consulting, 4) to vitalize studies on NCS-based teaching-learning and assessment methods, 5) to develop and distribute online education contents, and 6) to set up an online community for NCS education officials.

Diffusion of AI(Artificial Intelligence) and Vocational Education and Training for the Future

Gyu-hee Hwang, Ankook Kim, Jong-woo Kim

This study explores to derive the direction of future vocational training and education in the midst of the diffusion of technological changes such as intelligence information technology for the next 10 years. In addition, it attempts to bring the implications of the status quo of education system and policy, and improvement direction in the future.

It will be appropriate to focus on building up the cognitive ability and communication skills as vocational basic competencies in secondary education, and pursue the practical ability which is required by industry in later education-training system. The development of expertise that gives new values should be the main tasks of vocational education and training and for this purpose, the cultivation of professional manpower should be the core part of academic and industrial cooperation in higher education level. For professional vocational training institutions, they should provide the training for new comer in labor market and for the job changing worker and the current employees.

Besides, due to the diffusion of AI and the advancement of the fourth industrial revolution, the initial costs for the start-ups are significantly reduced as well as the new business opportunities are created. The business opportunities are wide open as 3D printers and Internet on things with AI is being developed, and the diminishment of the barriers of followers, new business and commercialization helps significantly lowering the initial costs for start-ups and activating maker's start-ups. It is needed to include the curriculum for maker's start-ups in the vocational education and training.

Analysis on Decision-making Factors of Freshman about Meister High School Entrance: Focusing on Developing of Policy Issues regarding Career Development & Employment

Seoung-Nam Kim, Il-Gyu Kang, Jong-Woo Kim

The purpose of this study was to analyze decision-making awareness of freshman about Meister high school entrance, and to examine comprehensively their individual and environmental characteristics and middle school life. At the same time, we identified the effect according to motivation of entering Meister high school by analyzing high school satisfaction and career plans after graduation. To achieve these purposes, we conducted a survey of Meister high school freshman in 2016, and the survey results showed that there were significant differences on the school satisfaction and career plans after graduation based on the motivation of entering Meister high school. Through these findings, we proposed several suggestions such as 1) operating career guidance program customized target-specific characteristics, 2) strengthening career guidance about vocational education and Meister school for middle school students, 3) building the career path of Meister high school graduates after entering labor market, 4) supporting finding out the competitive enterprises and constructing network between Meister high schools and enterprises.

A Study on Operating Systems of the National Career Education Center

Jeong, Yun-Kyeong

Park, Cheon-Soo

Jin, Mi-Sug

The purpose of this study is to examine the operating systems of the National Career Education Center to be designated by the government, pursuant to Article 15 of the law as enacted 「Career Education Act」 (promulgated on June 22, 2015, enforced on Dec. 23, 2015). To this end, we analyzed best operating practices of international and domestic relevant organizations related to the National Career Education Center, and collected the opinions of operating system for the National Career Education Center from various interest groups, including the academics, educators and policy-makers. Through these processes, we proposed three operational plans; at first, the vision, role and function of the National Career Education Center, second, organizational and personnel structures of the National Career Education Center and cooperation plans for linkages between the central headquarter and the local, among relevant organizations. And most of all, the National Career Education Center is only national institution dedicated to career education support to facilitate a smooth transition to the work of world from the school. It was important for the role and function as a hub linking domestic and international agencies linked career education resources and it suggested the need for personnel and organizational configurations for efficient business operations.

A study on volunteering programs for 'free semester'(jayuhakije) in Colleges and Universities

Chu, Hui-Jung
Lim, Hae-Kyoung

The purpose of this study is to analyze volunteering programs for 'free semester'(jayuhakije) in colleges and universities in Korea. The free semester system fosters young students' creativity and talent by freeing them from severe competitions as the program prioritizes intensive discussions in the class and field trips over written tests. Given the lack of social educational resources to provide useful field trips, success of the free semester comes from assertive outreach programs in colleges and universities

To examine college programs for free semester and to measure students' involvement, this study collected data 'social service competency', a PDF document written by individual colleges with free style by downloading from the Higher Education in Korea, the website providing academic information on colleges and universities. This study reviewed differences in the number of volunteering programs, requirements for credit and for graduation and extra-curricular volunteering activities across types of establishment, region, and size. In spite of authors'best efforts, the loss of data during transforming qualitative documentation into quantitative data change remains limitations of statistical analysis. Therefore, the authors carried out literature reviews, interviews and seminars as well.

The result of analysis implies that the most important factor in supporting a free semester program is the college's systematic efforts with emphasis on students' participation in social volunteering programs. Further detailed suggestions are discussed in the paper in order to encourage colleges and universities to prepare better services for the free semester.

A Study on ODA Supporting Policies of Efficient Vocational Education and Training Support Policies for Asia Developing Countries

Namchul Lee

Ji-Sun Chung

Hea Jun Yoon

The purpose of this study is to share the experience of ODA on vocational education and training development in South Korea with developing countries and to share the best practices of Korea's advanced policies and systems as a bridge between developing and developed countries. The purpose of this research is to promote friendship and mutual development between developing countries and South Korea. The methods for this study are analysis of literature and related data, an expert advisory meeting, conduction of internet survey, interviews with public officials and experts in the field of vocational education and training at home and abroad, shared research results, and previously held policy debates for verifying the validity of policy proposals.

The main research contents are Korea's ODA support policy and the analysis of the project status in 2016. It also includes analysis of ODA support in major asian developing countries in Korea(Laos, Myanmar, Bangladesh, Vietnam, Sri Lanka, Indonesia, Cambodia), actual situation and interview analysis of ODA in vocational education and training field, and policy suggestions.

Based on Korea's ODA policy and results, Korea's second ODA mid-term policy (2016-2020) focuses on diversifying its partnership with the private sector and contributing to a comprehensive business model. In addition, South Korea is making efforts to create markets and generate profits in developing countries by turning innovative ideas and partnerships into business opportunities. The Korea International Cooperation Agency(KOICA) supports partnership with developing markets and creating business opportunities through partnerships with social

enterprises, cooperatives, and small capitalist.

In 2015, Korea provided US \$ 1.9 billion to ODA projects, which was 0.14 percent of the gross national income(GNI). It was an 8.3 percent increase from 2014. South Korea is the 24th largest donor in terms of ODA to GNI among the Development Assistance Committee(DAC), and is the 14th largest donor when viewed on a scale. South Korea has set its ODA ratio target to 0.25 percent of GNI by 2015, but failed to achieve this because of the global economic stagnation, South Korea's fiscal tightening policy, and changes in GNI output. However, by 2030, the new target of ODA to GNI ratio was set at 0.30 percent. In order to reach this target, South Korea set up ODA growth plans at major stages.

The total amount of ODA in Korea in 2016 is 2,439 billion KRW, an increase of 61.2 billion KRW from the previous year. Of these, 1,947.9 billion KRW(893.7 billion KRW in grant aid and 1,542 billion KRW in free aid) was established in the multilateral cooperation project. In the case of free cooperation, the focus is on implementation of the project in accordance with the four development cooperation plans announced by President Park Geun-hye in 2015. On August 30, 2016, the 27th Committee for International Development Cooperation announced the amendment plan for the 2017 'International Development Cooperation Comprehensive Implementation Plan'. Major revisions include the increase in the budget for ODA from 2,728.6 billion KRW to 2,750.6 billion KRW, the number of projects from 1,295 to 1,307, the bilateral and multilateral ratio from 82.7 to 17.3 to 82.8 to 17.2, The ratio of grant and free aid was changed from 40.7 to 59.3 to 40.3 to 59.7.

The year 2016 is the year to implement the agenda for sustainable development in 2030 and the 'Basic Plan for the Second International Development Cooperation' in earnest. After the re-adjustment of the focus countries, the government drafted the second draft based on the opinions of the partner countries. After the final policy consultation, the governments of the 24 countries were confirmed.

The purpose, method and main content of ODA survey in vocational education and training field are as follows. This survey was conducted in cooperation with governments, research institutes and universities in asian developing countries (Nepal, Laos, Mongolia, Myanmar, Bangladesh, Vietnam, Sri Lanka, Indonesia, Cambodia, Pakistan and the Philippines). The purpose of this study is to investigate the problems and improvement plans of ODA in the field of vocational education and training in Korea for those who have completed education and training in Korea.

The subjects of this study were 585 specialists who visited the KOICA and visited Korea Research for Vocational Education and Training. The survey was conducted from August 4, 2016 to September 12, 2016 for 5 weeks. The main research questionnaires were divided into common questions, appropriateness, effectiveness, efficiency, influence and future sustainability.

The policy implications of this survey are as follows. First, it should be carried out based on in-depth demand survey of the recipient country. Second, post-management and monitoring of ODA projects are required. Third, it is required to establish and promote mid and long term ODA plan. Fourth, public development assistance experts should be trained.

The objectives, methods and main contents of ODA surveys in vocational education and training field are as follows. The purpose of the interview is to analyze the current status of ODA projects in the vocational education and training field in South Korea and to find ways to improve them. Also, it is aimed to draw in-depth opinions of domestic and international experts on the problems and suggestions on the implementation of the ODA project which was revealed in the survey results. The main interviewees were mainly the study countries, but they also included ODA experts from other countries.

The main implications of the interview findings analysis are as follows. First, medium to long term support through post management of project evaluation is needed. Second, the ODA for vocational education and training should be pursued by 'selection and concentration'. Third, there is a need for expertise in promoting the ODA project in the vocational education and training field. Fourth, the business linkage between the ministries should be strengthened. Finally, it is necessary to analyze the selection of the source country and the target of the recipient country in advance.

The policy suggestions through the results of this study are as follows. First, in terms of institutional aspects such as the implementation system and evaluation, it is necessary to unify the ODA project promoting agencies and establish a strategy-centered strategy for each region and country. Second, in order to expand the budget for the business support and build the foundation, it is necessary to strengthen the software support such as expansion of the budget to expand the project and support, hardware support such as establishment of vocational education and training institute, institutional basis and capacity building. Third, in order to establish and implement a systematic implementation strategy for promoting vocational education and training international development

cooperation, the government should promote the feasibility study, utilize expertise of the country's vocational training centers, and promote specialization of vocational training institutions in South Korea. Fourth, in order to carry out the project using the feedback of the vocational education and training project, it is necessary to strengthen the transparency and evaluation system of selecting the vocational education and training support target, utilize the professional evaluation institution, and follow up the vocational education, and training project thoroughly. Fifth, the government should work to enhance the image of South Korea through strengthening cooperative projects with the private sector and the government and international organizations, actively using policy consulting, and disseminating successful ODA programs.

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